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Dr Klaus Bung, Institute for Dynamic Language Learning, 68 Brantfell Road, Blackburn
BB1 8DL, England
t: 01254-261 009   m: 07729-90 60 30   e: info@rtc-idyll.com   w: rtc-idyll.com

Klaus Bung:

How to learn any language and remember 90%:

A practical guide to the IDYLL® METHOD™

Part 1: Why it works: The theory

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Contents

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Introduction

As a rule, teachers and learners grossly underestimate the number of revisions which are necessary for successful learning, and they know absolutely nothing about the correct timing of revisions. They then blame the resulting failures on the non-fact that languages are difficult or that the learners lack talent or dedication. Neither claim is true. No language is difficult if handled with the right methods. Every student who seriously wants to learn a language can do so successfully, provided he is given the right tools and uses them as instructed. Talent does not come into it. Diligence and self-discipline does.

This guide describes explicit procedures (learning algorithms) which can be taught to learners and help them to efficiently absorb vocabulary, idioms, grammar, foreign scripts and factual information. Learning algorithms shift the emphasis of work from teaching to learning, from the teacher to the student, who is responsible for his own progress and is given the learning algorithms as his most important tool. If parents have been trained, they can help their children apply the algorithms. No physical tools other than pen and paper are required.

The algorithms discussed control initial learning, leading to a retention span of 5 to 15 minutes. They then dynamically stretch this span over a period of 9 months or longer, increasing or decreasing the revision intervals for each item (e.g. vocabulary item) depending on the learner's performance. These algorithms are therefore called "dynamic" and "adaptive". Learning algorithms are the engine at the core of the IDYLL® METHOD™. In opposition to the silly advice "Revise as often as possible" which teachers often give to their students as a recipe for success in language learning, the IDYLL® METHOD™ proclaims "Revise as LITTLE as possible (but as often as necessary)". Another maxim of IDYLL® is: "You can minimise the time you invest in learning by revising before you forget rather than after you have forgotten, and by revising as late as possible but not so late that you fall into the abyss of forgetting" (since revisions done before forgetting take much less time than revisions done after forgetting).

The target standard is always 100%, and the actual retention attained is always 90%. Special revisions before tests and exams are not necessary. The student is ALWAYS well prepared, even though he "knows neither the day nor the hour" (Matthew 25:13).

Working to these high standards actually minimises learning time. Certain constants in the procedures can be adjusted (external adaptation) to allow for difficult languages, or slow learners, or for people who are fast learners and fast forgetters.

In traditional teaching and learning, success and retention is largely random. The teacher explains and practises, somehow, a large amount of information. Some of it (quite unpredictably) falls on stony ground, and some of it (50% or whatever the figure) is retained by some students but not by others. The effort in so-called teaching (presenting and practising) information which is then forgotten is completely wasted in respect of the student who has forgotten it. By contrast, everything that is controlled by the IDYLL® METHOD™ is entirely predictable. Each student receives only a limited amount of

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"information" (skills), but he is expected to remember (perform) 100% of it. IDYLL® does not try to teach what will not be remembered. Analogy: Traditional school teaching is like a carnival procession at which fistfuls of sweets are thrown into the crowd. 50% fall on the ground and are trampled on, and 50% are caught by joyful children. This is unavoidable, and perhaps even part of the fun, in a carnival procession, but it is not appropriate in education; for the sweets which fall on the ground mean failure and frustration, sometimes for life. By contrast, the IDYLL® METHOD™ makes the children queue, open their hands, and gives them the sweets one by one. We call this "child-centred teaching"!

More information can be found on the Internet (www.rtc-idyll.com) and in printed publications. The INSTITUTE FOR DYNAMIC LANGUAGE LEARNING™ also runs workshops for schools to train students, teachers and parents in the use of the IDYLL® algorithms as an adjunct to their existing course materials (to make even mediocre materials more effective, without having to change them altogether and unnecessarily upset too many existing users). Even if only students are trained, great gains can be made, but ideally students, teachers and parents are all trained, and co-operate with each other.

The INSTITUTE also offers consultancy services to schools which are considering changes in their teaching and learning methods.

Cartesian language learning

The algorithms discussed here are part of the Cartesian approach to language learning (but not by far all there is to it), which is characterised by the following features:

1. The main effort is shifted from teacher to student; it is a learning method, not a teaching method. The responsibility for successful learning is with the student and only to a limited extent with the teacher. The teacher becomes an informant, not the driving force of the process. The student becomes a kind of suction pump trying to get out of the teacher and out of books as much information as he can. This information (= skill) then has to be absorbed and retained by the student, and our algorithms control in every detail how this is done.
2. The subject matter (in our case vocabulary, grammatical forms and sentence fragments) is broken down into small fragments, called items. This is typical for the Cartesian method.
3. The items are arranged into increasing order of difficulty (Cartesian method).
4. The various part-skills, and learning and teaching techniques, are carefully and rationally balanced (an engineering job) so as to achieve the intended goal and guarantee success. No one technique is used exclusively. Different techniques are used for different, precisely specified, purposes.
5. Nothing is left to chance, whereas in traditional teaching virtually everything is left to chance. The teaching steps are carefully planned, evaluated and improved, in the same way in which you develop and test a computer program until it reliably does its job: This is "programmed instruction" (programmed learning) (Lumsdaine and Glaser 1960).

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6. When a computer program delivers the wrong results, you do not blame the keyboard operator, or the dead patient whom you have killed by calculating the wrong dosage, but the programmer.
7. Problems which arise are resolved by detailed analysis.
8. Some of the techniques used are algorithms and core parts of the method. Others are in the nature of preferences and recommendations. They are discussed in Part 2.

Why has the IDYLL® METHOD™ been called "the Cartesian Approach to Language Learning" or simply "Cartesian Language Learning"?

In his book "Discourse on Method", the French philosopher René Descartes formulated four principles (including "division of problems"), which have since become (together with Adam Smith's principle of "division of labour") the basis of modern science and technology. All our modern prosperity rests on them.

They are:
1. never to accept anything for true which I did not clearly know to be such; that is to say, carefully to avoid precipitancy and prejudice, and to comprise nothing more in my judgment than what was presented to my mind so clearly and distinctly as to exclude all ground of doubt.
2. to divide each of the difficulties under examination into as many parts as possible, and as might be necessary for its adequate solution.
3. to conduct my thoughts in such order that, by commencing with objects the simplest and easiest to know, I might ascend by little and little, and, as it were, step by step, to the knowledge of the more complex, ...
4. in every case to make enumerations so complete, and reviews so general, that I might be assured that nothing was omitted.

(René Descartes: "Discours de la méthode", 1637. Translated by John Veitch, Everyman's Library, Vol 570, London 1912, Part 2, p 15-16)

In brief:
1. Question all dogmas = Systematic scepticism
2. Divide problems into their components = Division of tasks
3. Solve the problems in ascending order of difficulty = Easy before difficult
4. Make diagrams and enumerations = Diagrams and lists

Principle 1

Concerning Principle 1, nobody can credibly claim to be entirely free of prejudice but it can be claimed that the IDYLL® METHOD™ is, often and obviously, less governed by prejudice than some traditional methods, that it tends to be much more rational and analytical, looking at very small components of the learning process and therefore able to re-assemble them differently (synthesis) and come to different conclusions, making things possible which are apparently impossible in less analytical approaches to language

learning. The combination of analysis and synthesis is characteristic of the IDYLL® METHOD™.

Principle 2 and 3

Principle 2 is an outstanding feature of the IDYLL® METHOD™. It shows itself in the fact that the IDYLL® METHOD™ has special techniques for the learning of vocabulary (words are easier to learn than sentences) and that we learn many words before we practise them in context.

But we go even further and often look at the components of words and help the student to take advantage of such knowledge for faster learning. When learning foreign scripts we even look at the components of characters where convenient.

We make the student AWARE of every detail, to aid initial learning (the very first steps), and then practise in such a way that handling of the language becomes automatic. This distinguishes Cartesian Language Learning from many other methods, including the Direct Method and certain immersion methods of language learning.

Whatever causes difficulties for a student, we spot it, break it down into its components, then learn the components one by one, and then synthesise the components to re-create the whole. The technique of quasi-algorithms (subject-matter algorithms) can be used to identify (diagnose) exactly WHERE a student encounters problems. (Bung and Sánchez 1978)

Principle 3

Principle 3 is also an unmistakeable feature of the IDYLL® METHOD™ and is applied with more rigour than in many traditional methods. Principle 3 cannot easily be used unless preceded by Principle 2. Therefore approaches which are reluctant to break the subject matter down as much as the IDYLL® METHOD™ does will not be able to achieve the sequence of Principle 3, ascending from easier to more difficult and making things easy enough at the beginning. Bung 1967b and 1973 has shown that tasks cannot be successfully sequenced from easier to more difficult if the analysis of tasks has not been done thoroughly enough, i.e. if a complex task remains unanalysed and contains several components each of which requires different sequencing. This is often the case in traditional language courses.

Principle 4

Principle 4: This is used not only by the IDYLL® METHOD™ but also by other good traditional methods, but not by bad ones.

Teaching algorithms and learning algorithms

An algorithm is a mathematical or computational procedure which is explicit and effective and which, given the same input (starting conditions), always produces the same result, in our case 90% retention of all items which have gone through the procedure (algorithm).

The concept of algorithm (subject matter algorithm) has been introduced into education mainly by the Russian psychologist L N Landa, and the German cybernetician Helmar Frank (computer controlled teaching algorithms). Klaus Bung (1972) introduced subvariables into Frank's model of the didactic variables, and developed the concept and distinction of subject matter algorithm (eg grammatical rules), teaching algorithms (specifying the actions of a teacher or a teaching machine/computer) and learning algorithms (specifying the actions of the learner, trying to master the subject matter algorithms).

To keep this exposition simple, we restrict our subject matter to vocabulary. We will later show that our learning algorithms can be used with equal effectiveness for other types of subject matter.

The IDYLL® METHOD™

The learning algorithms whose principles I have to describe here form the core of a comprehensive system of language learning known as the IDYLL® METHOD™. This system prescribes a standard layout for any subject matter to which learning algorithms are to be applied.

Whatever I say here is meant in the strict sense of my words, it is not approximate, it is not in the nature of a recommendation.

The words are divided into exercises of 10 items. The student does not proceed from one exercise to the next unless he has mastered it. Mastery is defined as: the student has given 10 correct answers (responses) in succession, i.e. 100% success.

Before we proceed, let us look at some exercises in popular languages. The student has to learn 10 words by translating them from source language (e.g. English) into target language (e.g. French etc). Further examples with notes can be found in Part 3 of this book.

The standard format of IDYLL® exercises

French

Exercise 1

1   the father

        le père (m)   /lə pɛ:r/

2   the mother

        la mère (f)   /la mɛ:r/

3   the child

        l'enfant (m or f)   /lã'fã/

4   the man

        l'homme   /lɔm/

5   the uncle

        l'oncle (m)   /'lɔ~:klə/

6   the aunt

        la tante (f)   /la tã:t/

7   my uncle

        mon oncle (m)   /mɔ~:'nɔ~:klə/

8   my aunt

        ma tante (f)   /ma tã:t/

9   the pen

        la plume (f)   /la plym/

10   the pen of my aunt, my aunt's pen   :-)

        la plume da ma tante   /la 'plym də ma 'tã:t/

Note: The French equivalent of English "la plume da ma tante" is "My tailor is rich. My tailor is not rich" (Mon tailleur est riche). These sentences have become proverbial in

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France since they were first used as opening sentences of the very popular recorded (8-inch vinyl disks) language course "Assimil Anglais" / "Anglais sans Peine"). Among the novels in which they have been quoted is Georges Perec: "La disparicion" (1969).

Spanish

Exercise 1

1   the boy

       el chico (m)   /ɛl 'tʃi:ko/

2   the girl

       la chica (f)   /la 'tʃi:ka/

3   he speaks

       el habla   /ɛl 'abla/

4   she speaks

       ella habla   / 'ɛʎa 'abla /

5   well

       bien   /bĭɛn/

6   He speaks well.

       El habla bien.   /ɛl 'abla bĭɛn/

7   Spanish (the language)

       el español   /ɛl espa'ɲɔl/

8   He speaks Spanish well.

       El habla bien el español.   /ɛl 'abla bĭɛn ɛl espa'ɲɔl/

9   The girl speaks Spanish well.

       La chica habla bien el español.   /la 'tʃi:ka 'abla bĭɛn ɛl espa'ɲɔl/

10   the teacher

       el profesor (m)   /ɛl profe'sɔr/

Italian

Exercise 1

1   good

       buon   /buˈɔn/
       Memory aid: bonus, bona fide

2   the day

       il giorno (m)   /il ˈʤorno/
       Memory aid: journal

3   Good morning (literally "Good day")

       Buon giorno   /buˈɔn ˈʤorno/

4   the evening

       la sera (f)   /la ˈseːra/
       Memory aid: serenade

5   Good evening

       Buona sera   /buˈɔna ˈseːra/

6   the night

       la notte (f)   /la ˈnɔt-te/
       Memory aid: nocturnal

7   Good night

       Buona notte   /buˈɔna ˈnɔt-te/

8   Thank you

       Grazie   /ˈgraːtsie/
       Memory aid: gratitude, grateful

German

Exercise 1

1   the crocodile

       das Krokodil

2   swims

       schwimmt

3   in the Nile

       im Nil

4   The crocodile swims in the Nile.

       Das Krokodil schwimmt im Nil.

5   the river Rhine

       der Rhein

6   in the Rhine

       im Rhein

7   the pig, the swine

       das Schwein

8   The pig swims in the Rhine.

       Das Schwein schwimmt im Rhein.

9   the fish

       der Fisch

10   the water

       das Wasser

Exercise 2

1   drinks

         trinkt

2   The fish drinks water.

         Der Fisch trinkt Wasser.

3   the wine

         der Wein

4   the woman

         die Frau

5   The woman drinks wine.

         Die Frau trinkt Wein.

6   the beer

         das Bier

7   the man

         der Mann

8   The man drinks beer.

         Der Mann trinkt Bier.

9   blue

         blau

10   The woman is blue.

         Die Frau ist blau.

Absurd sentences can be very useful. Not only for learning vocabulary but also for learning grammar. They are often more memorable than "reasonable" sentences. If you learn to form correct sentences about rabbits conducting a motor cycle race in the coffee cup (an idea I owe to an excellent American programmed Spanish course; Grolier), or impatient snails queuing and blaspheming at the ATM machine, you have learnt something memorable and you can easily adjust it to human beings queuing or swearing. We should not be obsessed with the immediate usefulness of the sentences we practise. Such

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usefulness is necessary and justified in a phrase book for tourists, but not in a language course, whose purpose it is to teach language and not ready-made sentences to be used in popular situations. I have been to language courses which avoided grammar and systematicity and focussed on "useful" sentences to such an extent that they became courses in sentence learning (much as vocabulary learning in the olden days but much more difficult). Some of the best and most useful textbooks on my bookshelves, some very old, are comprehensive and leisurely, teach the principles of the language and train the student to adapt these to any concrete situations that might arise. Absurd examples for vocabulary and grammar can be beneficially used for similar purposes.

Urdu

Exercise 1

1   rice

     'tʃa:val (m)

2   white

     sa'fe:d

3   coal

     koi'la: (m)

4   black

     'ka:la

5   blood

     xu:n

6   red

     surx

7   banana

     'ke:la: (m)

8   yellow

     zard

9   grass

         g^ha:s (f)

10   green

         sabz

Note: In this vocabulary exercise, we are pairing primary colours with typical objects to stimulate and utilise visual imagination.

Arabic

In the Arabic example, the student translates English words into Arabic and learns writing them in IPA and in Arabic script. In the second example, he is given the Arabic letter names in IPA and converts them into Arabic script. Usually the student will have handwritten exercises in front of him which he has written out himself, a preliminary stage of learning.

The student never spends time just looking at text (or mumbling words, or mentally "concentrating on them") in order to learn them but is always active trying to answer one question after another always in writing, an observable activity, which can be subdivided, when required, into the skill of writing each letter. In our first example, the student translates words from English into French, or whatever language). He is "doing one item after another." He covers the model answer with a slip of folded paper, writes his own response on this paper, and pulls it down to reveal the correct answer. He determines whether his answer was right or wrong.

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On the basis of this evaluation PAPA (the Pen And Paper Algorithm) knows approximately the retention time the student has achieved. IDYLL$^{®}$ tests not only correctness but also retention time. A correct response after 20 seconds is treated differently from a correct response after 15 minutes, 2 days, or after 4 months.

Why is PAPA a "dynamic" learning algorithm?

PAPA determines in which sequence the items have to be tackled (i.e. how much time in seconds, minutes, days, or months, has to elapse between each revision of the same item). Times are approximate but determined by precise rules.

If the student gives a correct answer after x time, PAPA increases the interval before the next revision. If the student gives a wrong answer after x time, PAPA decreases the interval, and continues doing so until the student begins to give correct answers. Such algorithms are called adaptive because they respond to the student's behaviour. The system is called "dynamic" because the intervals are continuously changing, up or down, like a thermostat.

The intervals are controlled at the macro-level with the help of a revision diary which determines the intervals between learning sessions in terms of days, weeks and months, increasing or decreasing them as required.

The intervals are controlled at the micro-level within one learning session (duration of 30 to 60 minutes), in terms of seconds and minutes (varying from, say, 20 seconds to 3 minutes, the time it takes to do one run through an exercise). This is done through a decision mechanism (learnt by the student as part of his training in using the IDYLL$^{®}$ METHOD$^{™}$) which determines, on the basis of the learner's correct or incorrect responses, which item is to be tackled next, i.e. in which sequence the items are to be tackled. These sequencing decisions automatically determine the timing (revision intervals).

The initial objective of PAPA is to achieve a retention of, say, 20 seconds for one item, which is like putting a car into first gear. In other words, PAPA attempts to get a correct response 20 seconds after the learner has last seen and copied the correct answer. PAPA then tries to stretch this retention time to, say 3 minutes, 15 minutes, 1 hour, 24 hours, etc, to 4 months. This is like putting a car gradually from first gear into fifth gear.

Variants of PAPA

There are three variants of this algorithm, PAPA-BASIC, PAPA-INTERMEDIATE and PAPA-PREFERRED.

PAPA-BASIC is the easiest to learn but less efficient. PAPA-PREFERRED is more difficult to learn but extremely efficient. PAPA-INTERMEDIATE is a compromise between ease of acquisition and efficiency.

It always pays to let students learn PAPA-PREFERRED. But it is good policy to teach them PAPA-BASIC and PAPA-INTERMEDIATE as an introduction to the IDYLL® METHOD™ (the micro level), then teach them REV, the revision algorithm, which stretches the retention time from 24 hours to 4 months, and ENFA, the Enforcer Algorithm, which deals with items which are trying to slip through the net, i.e. which one particular learner finds extraordinarily difficult. There are precise rules for dealing with such items (e.g. words or grammatical forms). Recalcitrant items are so ground down by the Enforcer Algorithm, that eventually these difficult items are the easiest, the tamest, and eat out of the learner's hand. It is impossible for a difficult word, or form or rule to resist extraordinary rendition. As an ancient Indian text says: "On this path no effort is ever lost and no obstacle prevails" (Gita 2:40). This promise applies to our language learner too and it gives him confidence.

PAPA-BASIC vs. PAPA-PREFERRED

PAPA-BASIC is simple: The learner tackles one item after another, from 1 to 10, and again from 1 to 10, until he has made 10 correct responses in succession. You can imagine the items as numbers 1 to 10 on a circular track. The learner keeps going round and round practising until he has mastered the exercise.

The Mills of God

main track

PAPA's response to mistakes in item 2, 3 and 5

satellite track

The Mills of God grind slowly But exceeding fine.

PAPA-BASIC is an algorithm, but not a dynamic one; it does not adapt to the learner's performance. It uses only the "main track" (which accommodates 10 items). Once the student has mastered an exercise through PAPA-BASIC, this exercise is passed to REV, the retention algorithm, which is adaptive, and is easy to learn.
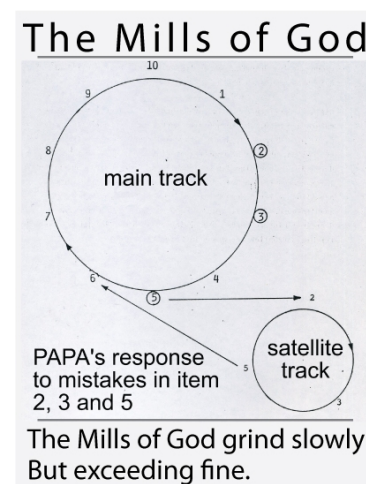
PAPA-PREFERRED is dynamic and controls the learner's behaviour at the micro-level, i.e. within one learning session. The goal is the same as that of PAPA-BASIC, namely to obtain 10 correct responses in succession from the student, i.e. to get the student to exhibit a retention time from between 1 and 3 minutes. But PAPA-PREFERRED achieves this in a more sophisticated way (and more quickly) than PAPA-BASIC.

In this Part of the book, I will describe only the principles of PAPA and not the technicalities. Learners have to understand, and be in sympathy with, the principles. Otherwise the technicalities will appear tedious, and the learners will not follow the very precise instructions of the algorithm.

Any deviation, however small, from the literal application of the algorithm will destroy its effectiveness, which has been tested over and over again, and cannot be improved at the whim of a teacher or a learner who have only a partial understanding of the system as a whole. Deviations which appear trivial to the learner can be fatal for the algorithm, which depends on all its components being exactly where they are expected. Analogy: two trapeze artistes. Each of them depends on the other being exactly where he is expected. If one partner varies his position even slightly, the other one can fall to his death, no matter how good an artiste he may be himself.

PAPA-PREFERRED is very much an exemplification of the Cartesian principle that problems have to be divided into manageable chunks. The IDYLL® METHOD™ says in addition that no task is so easy that it cannot be made even easier (by further division) if a learner requires it (i.e. "no obstacle prevails").

Principles of PAPA-PREFERRED: Divide and rule

The task in front of the learner is not to learn French, German, Spanish, Latin, Greek, Sanskrit, Arabic, Chinese, or whatever, but to learn ten words. That is manageable.

On the main track, PAPA-PREFERRED looks for three words which the learner does not know (i.e. gives wrong responses to). These three words are then placed (by the system) on the satellite track.

Physically they stay in the IDYLL® Workbook (see image above, handwritten Arabic example, and handwritten examples in Part 3). The task at hand has now been reduced from 10 items to 3 items, from the main track (testing track) to the satellite track (intensive track). Psychologically the student can relax. He may be phased by the task of learning 10 words, but not by the prospect of having to learn 3 words. (Removing stress is an essential part of the IDYLL® METHOD™ and helps to make it so effective.)

Even better: The student's task is not to learn all three items. All he is expected to do is to give one correct response, to remember just one of these items, any item, for just 20 seconds. No student can say that this is too difficult, especially as he can go round the satellite track at leisure and as often as he likes.

If the three items on the satellite track are 2, 3 and 5, the student tries 2, 3, 5, 2, 3, 5 etc etc, until he has given one correct response, which proves a retention time of, say, 20 seconds or less for that item. There are now only 2 items on the satellite track (and a record of them is kept there). PAPA-PREFERRED therefore sends the student back from the satellite track to the main track. The student continues working his way around the main track and tries to find another unknown item (item with an incorrect response). The student is happy when he makes a mistake because this is his entry ticket for the nice and leisurely satellite track. He knows that the satellite track is his short-cut to success. O felix culpa! As soon as the student has a total of three incorrect items (e.g. two still remaining on the satellite track from his last visit there, plus the one just found on the main track, testing track), he returns to the satellite track and tries to eliminate one of the three items, a stress-free but very effective task.

This dynamic interaction between the main track and the satellite track is continued until the student has reached his objective for this learning session: 10 items correct in succession. This means that for each item in the exercise a retention span of, say, 3 minutes (i.e. the duration of doing the whole exercise once while giving only correct responses) has been demonstrated. You might call this "second gear" when driving a car.

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PAPA-PREFERRED (interaction of main track and satellite track) and the objective of mastery (10 items correct in succession) applies not only to initial learning but also to each revision.

In the IDYLL® METHOD™ there is no difference between learning and testing. Every learning session has the form of a test: questions and answers which gradually move up from guessing to unshakeable knowledge. This reduces tension and ensures that the algorithm continuously monitors the learning activities of the student. It also ensures that the student does not spend a minute more on "learning" (whatever that might be) than is absolutely necessary. The moment he passes one of his continuous "tests", he can stop work or move on to the next exercise (= test).

The learner's first round on the main track is a sequence of guesses with a, say, 2% probability of success. This probability increases with each round of the guessing game until the learner has learnt to guess the answers of one exercise with a 90% probability of success. If the student is dead-sure about one item (e.g. English "house" = German "Haus"), then we say that he can guess the answer with a 99% probability of success. Whatever answers we give in life, even from profound "knowledge", our answers are always guesses - with varying probabilities, and never quite 100%. The sun will probably rise again tomorrow morning, but even James Naughtie, the Pope, or Great Homer may just very occasionally slip up. Learning can therefore be seen as systematically increasing the probability of correct guesses. The IDYLL® METHOD™ recognises this, and the student can relax (very important!). All he is expected to do is to guess - no guilt is involved. Initially he guesses largely wrong, eventually he guesses right. The algorithms lead him from darkness to light, from weak guessing to good guessing, from diffident guessing to confident guessing.

There is also no difference between the rules which apply to initial learning or to revisions (after days, weeks or months): The same learning algorithm is used (PAPA), the target standard (mastery = 100% correct answers in succession) for the revision is the same. The student continues with the exercise until he has "mastered" it. The expectation is also the same: 90% retention on average. Each item that has failed (when the revision intervals have reached a specific point: R7) is copied into ERB (the Extraordinary Rendition Book), which causes 11 additional revisions distributed over nine months (but no howling and gnashing of teeth). Here again our motto "And no obstacle prevails" applies.

Because of Extraordinary Rendition, it cannot happen that the 1-item per exercise failure rate (forgetting) which the system permits gradually builds up a large collection of unknown items.

Learning is obviously much more fun
- if the student experiences almost nothing but success,
- if he feels in full control of the subject he is studying,
- if he can walk full of confidence into any exam at any time, without special revision just before the exam,
- and if, moreover, learning itself is so extraordinarily easy.

IDYLL® provides all that.

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From the bird's eye perspective, what is happening is that the algorithms are looking for "easy meat", for soft targets, items which are easy to learn, and get them out of the way. Over a period of about nine months a residue of obstinate items (refusing to be remembered) is filtered out and subjected to ever increasing pressure to submit (to be learnt). The more obstinate the item, the greater the pressure. There is no point in applying this pressure, these extraordinary techniques, to soft targets which do not require them. Since no item is ever allowed to escape for good (call it the Inspecteur Javert syndrome [Les Misérables]), this happens not only in the short-term, hours and days, but also in the long-term, after an interval of many months.

Provision for special learner types

It is one of the outstanding features of the IDYLL® METHOD™ that it provides not only different routes to the objective for different learners, the most efficient route for each learner, and that it also provides precise instructions for learners who fall by the wayside and tells them how to get back on the rails in the most efficient way (e.g. students who have missed a few revisions, or several months or years of revision, because of illness, change of occupation, etc).

The method has been designed to have general applicability, not to work only in one specific case and context, but in all cases, with teacher, or without teacher, for advanced students or beginners, for gifted students and for slow learners, etc etc, and all this with the simplest possible rules.

I will mention here only the provisions for altering the size of the main track and the satellite track. When my experiments with PAPA first started, ages ago at Arizona State University, the large track contained 30 items, i.e. proof of mastery was "30 items correct in succession", which meant that the retention span achieved during initial learning was very long but also very difficult to reach. Students often had to do 30 items again because of only 1 mistake. This had certain advantages but the current version, of a 10-item main track with a 3-item satellite, has proved most effective over the years - for normal language pairs and for normal learners. So that is the standard, but we deviate from it when we have good reason.

The 10-item main track is accompanied be the 3-item satellite. The size of these tracks can be adjusted to suit certain learners or certain language gaps.

Adjustments for difficult languages

Language gaps: If L1 (source language) and L2 (target language) (e.g. English and Spanish) are closely related, there is a small language gap and L2 can be said to be easy, or "normal". The values 10 and 3 for the main track and the satellite track respectively have been tested for a normal language gap.

Sanskrit, Hindi, Urdu and other Indo-Arian languages are comparatively distant from English and therefore may be treated as "difficult" languages. When dealing with difficult languages, we change the values of the tracks: main track = 5 items, satellite track = 2

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items. PAPA rules remain unchanged (except that these two constants are altered). The effect of reduced values are that there are more intermediate steps before full mastery on the 10-item track is achieved. The intervals between revisions become shorter, and initial retention becomes easier and therefore faster.

The standard exercise is divided into two halves, 1-5 and 6-10. The student continues working through 1 to 5 until he has achieved mastery. He slips into the satellite track as soon as he has found two unknown items (2 mistakes). Once 1 to 5 has been mastered, the learner tackles 6 to 10 in the same way. THEN he tackles 1 to 10 in the "normal mode" (track size of 10 and 3). This is like helping someone, e.g. an apprentice burglar, to mount a wall by putting many small steps in front of it, but eventually the apprentice, if he wants to be recognised as a master burglar, has to jump over the wall without these helping steps.

The situation will be different for a speaker of Hindi (native speaker, or someone who has already learnt Hindi well). For him Sanskrit will be "normal" and track size 10 and 3 will apply from the beginning. Similarly Latin will be "normal" (easy) for a speaker of Italian or vice versa.

Adjustments for slow learners

The same adjustment can be made to help people who, for whatever reason, find learning a so-called "easy/normal" language difficult. Let's call them "slow learners". If such a learner finds normal track size (10 and 3) frustrating, he can switch to track size 5 and 2.

For most English learners, Spanish will be normal (easy). Most Spanish learners will find Italian normal/easy. But if any such learner has difficulty with the normal track sizes, he can switch to the easy (smaller) track sizes. In brief: slow learners or "difficult" languages are treated in the same way.

This facility is extemely useful for failing schools, or schools classified as failing in modern foreign languages.

Adjustments for fast learners and fast forgetters

On the other hand, there are certain learners who are fast learners and fast forgetters. I have had such people in my courses on the IDYLL® METHOD™ . Some computer programmers were of that type. They were very fast in achieving mastery in initial learning. But an hour later they would have forgotten what they had learnt, whereas more normal learners would remember the predicted 90% or more after one hour.

The fast learners might be given an exercise with 10 unknown items, go round the main track once, and in the second pass get every item correct, whereas a normal learner might have to go 5 or 8 times round the main track before achieving mastery.

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An hour later though, the normal learner will remember 90%, whereas the fast learner (e.g. computer programmer) will remember only 50%, which in the IDYLL® METHOD™ is quite unacceptable. Such learners have to be forced to do more repetitions (especially of "known" items) on the main track before mastery can be declared.

The PAPA rules are so designed that the few obstinate items in an exercise force the student to practise also the known items, thus ensuring that they are better anchored in his memory. (This is sometimes called "overlearning", a rather misleading and woolly term. In the IDYLL® METHOD™ there is no OVERlearning but only the correct amount of revision to achieve the objective.)

Before we release the fast learner (e.g. that notorious computer programmer) from the main track, he has to demonstrate twice the normal retention span for all items, i.e. when the duration of the main track is, say, 5 minutes, the normal learner who gives 10 correct responses in succession provides evidence of 5 minutes retention of each item.

To ensure that the fast learner (computer programmer) does well during the later revisions, we must force him to demonstrate a longer retention span than the normal learner. We achieve this by doubling the size of the main track. The size of the satellite track remains unchanged. So for the computer programmer the track sizes are: main track = 20, satellite track = 3.

The fast learner will combine two 10-item exercises to get one 20-item exercise, e.g. Exercise 10 and 11 will be combined. The procedure is then as follows:
  * Mastery of Exercise 10 (This means that the main track size is, at this stage, normal: 10 and 3)
  * Ditto Exercise 11
  * Then Exercise 10 and 11 in succession (This increases the main track size to 20, with size 3 for the satellite track).

Mastery can be claimed only when the student can make 20 correct responses in succession. If he makes one single mistake, however small, he has to go through the whole track again. This can happen repeatedly, just because of one mistake, and perhaps each time in a different item because of lack of concentration. etc. This ensures that the fast-learner cum fast-forgetter gets the number of revisions of all items that are required for long-term retention.

Algorithms eliminate desire, fear and anger

The objectivity of the learning algorithms helps to remove the three great enemies of successful language learning: desire (greed), fear and anger.

Desire causes the learner to want to progress too fast (unrealistic expectations). He will then be frustrated and disappointed when he cannot learn and remember at that speed. Analogy: If a train journey in India takes 38 hours, that's what it takes. I will not fret but will take enough food and water and learn Hindi so that I can enjoy the company of the

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other passengers. I cannot change the railway timetable (corresponding to the laws of human memory): I must adjust my behaviour to it.

Desire also causes the teacher (often constrained by an unrealistic syllabus) to force a class through a course, thinking he has done his duty if he has "covered" (presented) the subject, even if the students have not learnt it. The algorithms represent an immutable railway time table. Like it or not, you can not learn faster than what the algorithms say. You can only pretend to be learning, as many students do. The speed of light, for example, is an absolute. You can not beat it, therefore you should not desire to do so.

Fear causes the learners to expect failure, not to trust in their own learning skills, wasting energy on repeating "I cannot do it". These fears tend to be self-fulfilling. The algorithms set the student a simple goal, which he knows he can achieve, namely to answer correctly just one question on the satellite track. He need not worry: "What comes after that, and what after that". He needs to learn only one word, and can trust that the algorithm will tell him, unambiguously, what to do next. (Even when the student has missed out on some revisions, the algorithm prescribes the optimal remedy.). The student can focus on that one word. Concerning the other words he can say: "We will cross that bridge when we come to it, the algorithm will take me across that river, or even that ocean". He can trust the algorithm like a child can trust his parents. Working with the algorithms has something of the calming effect of meditation exercises. The student is concerned only with the here and now. His task is not even to write one word, his task is only to write the next letter. Fear will cause him to worry about the future, and whether he will perform well. The algorithm removes this fear by letting him do only one thing at a time.

This total absorption into his work is more easily achieved if the student uses pen and paper rather than a computer when doing his IDYLL® exercises.

Anger is a most dangerous emotion for adult language learners. Instead of following the simple instructions of the algorithm in case of a mistake (write down the number of the mistake, cross out the error, copy the correct answer, move on to the next item), many, if not most, untrained students respond to a mistake by passing judgement on themselves or on the system: "Your system does not work. You see I told you I can remember nothing, I am bad at language learning. This language is impossibly difficult." They are reflecting on their failures (wasting time and energy). I never promised these students that they would not make mistakes. What I promised was that I would diagnose their weaknesses and eliminate them. IDYLL® welcomes mistakes. It means that they can be eradicated. Mistakes are a symptom of ignorance. Even if the mistakes are not made (e.g. because a question is not posed, or because of cheating), the ignorance is still there. If I make a mistake, I am happy since the mistake diagnoses a weakness. Mistakes are the rungs on the ladder to success. Once I can get a student to trust in the algorithm, his anger will disappear and he will gain at least 30% in his learning efficiency.

As part of the system, the student will become aware that cheating is not a clever thing that harms the teacher or examiner, but that cheating is something bad that he does to himself. If he cheats, he shoots himself into his own foot because he will not then learn. By thrusting the responsibility for progress and learning on the student, away from the teacher, the student becomes aware that the purpose of learning is not to get certain grades or to please or benefit the teacher, but that the purpose of learning is to acquire

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skills. Learning does not benefit the teacher but the student. Therefore there is no point in either sabotaging the teacher or in cheating and pretending to the teacher that the student knows more than he actually does. The goal of learning is knowledge (and skill), not evidence (or semblance) of knowledge and skill.


Silly advice often given to language learners

Books on study methods often refer to the concepts of long-term and short-term memory. These concepts are so coarse that they cannot help learners in the slightest. There is no such thing as a short-term or long-term memory. Any dividing line is arbitrary. No useful learning advice can be based on such concepts. The IDYLL® METHOD™ by contrast is based on a more realistic and useful memory model which assumes infinitely many memory layers, each of which associated with a different retention time. (Bung 1991a). The Memo-Sutras contained in Bung 1991a state succinctly the assumptions of that model, and all practical consequences can be derived from it, for example the algorithms presented in this book, the ideal revision times , and how to learn more by revising as little as possible.

It is the task of the learner to heave each item first into a memory layer with a short retention span (e.g. 20 seconds) and then do each subsequent revision at a time when it maximises the increase of memory span (jump from one memory layer to another). This will make the time taken for each revision as short as possible and enable the student to revise as seldom as possible.

We do this by revising as late as possible (i.e. make fewer revisions) AND as early as necessary to avoid forgetting. For this purpose, the ideal time for revision is just before the projected time of forgetting (which is computed by the IDYLL® algorithms at the level of 90% retention), i.e. we revise when we expect that the learner still remembers 90%. If we revise too late, the student will forget too much (make more than 10% mistakes), if we revise too early, the student will have wasted time and the jump to a deeper memory layer will be smaller (i.e. increase in retention span will be smaller). The revisions must take place when there is at least a CHANCE of making a mistake, but only a 10% chance. Even mistakes have a right to exist: we welcome them - in moderate numbers, in the right proportion. Like immigrants, they are the spice of life. The IDYLL® revisions therefore must take place very close to the abyss of forgetting - as close as possible but not too close. In the words of an ancient Indian sage: "This is a path most difficult to tread, sharp like a razor's edge" (Katha Upanishad 1:3:14).

The memory layers we have been talking about do, of course, not physically exist but are only a model based on our observations of the functions of remembering and forgetting. Another model, more concrete and less likely to cause confusion between model and physical reality, is a system of conveyor belts.

The IDYLL® Learning Engine

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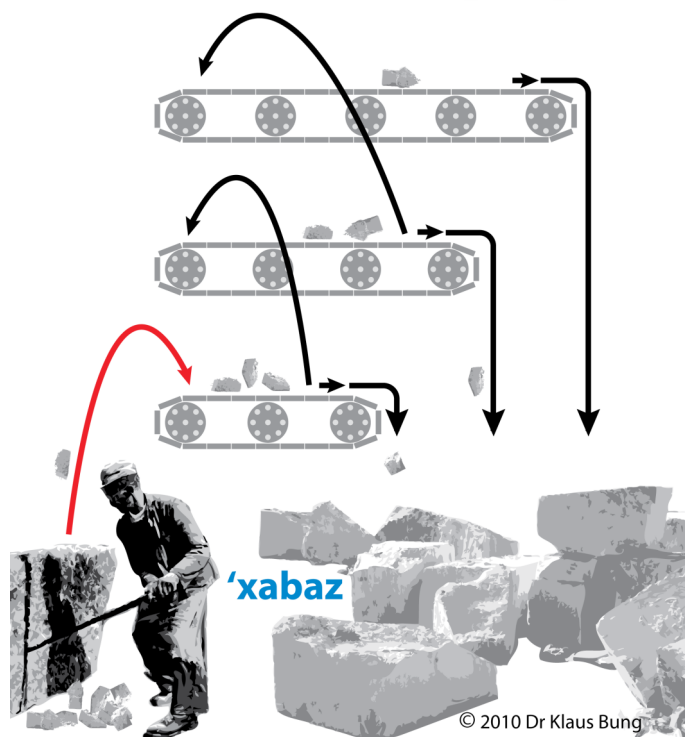
Men work in a quarry to break up huge blocks of stone into manageable sizes. This work, which is not algorithmic, neither in the quarry nor in the study, has close analogies to the early tasks in language learning, which has to be done by the teacher (or textbook author), or by the student himself if teachers and authors have not done an adequate job. Details of this work have been, or will be, discussed elsewhere.

Initial learning corresponds to the act of lifting the stones onto the lowest conveyor belt. Each revision lifts the stones from one conveyor belt to the next higher one, with a longer "running time", i.e. the distance between the required revisions increases. Any student of yours can easily see that. If the student is not in position at the end of each conveyor belt to move the stones to the next belt, the stone will drop back into the quarry and the whole process has to start again, a silly and completely avoidable waste of time, and also frustrating and demotivating. But this is what most language learners do and what most language teachers do not prevent. No wonder that language learning is unpopular and considered difficult. The IDYLL® algorithms predict when each stone is about to reach the end of its belt and has to be lifted to the next.

The endlessly repeated advice from teachers to their students: "Revise as often as possible" is silly nonsense. It guarantees failure: No student working on this basis will make the number of revisions necessary for him to be successful. The IDYLL® METHOD™ proclaims instead: "Revise as seldom as possible, but as often as necessary", and our algorithms tell the student WHEN it is necessary.

An attitude that prevails in schools is: "We have to revise because you have forgotten". This is also stupid and wasteful. The IDYLL® METHOD™ says: "You have to revise before

you forget, and in order not to forget". If a student follows the IDYLL® maxim, each revision will give him a feeling of triumph ("Yes, it is true, I can remember everything, I am a good student, language learning is fun"), rather than of regular frustration as in most schools. He will therefore want to study more and do his revisions on time.

Parents trained in the IDYLL® METHOD™ can help to encourage this and ensure that the student follows the absolutely vital revision schedule. Pupils, parents and teachers have to work together. Each makes an important contribution to the ultimate success.

The revisions before forgetting take only a few minutes whereas revisions after forgetting take many times more time than the IDYLL®revisions.

Subjects to which IDYLL® learning algorithms can be applied

Our learning algorithms can be applied to any language, to the learning of vocabulary, sentence fragments, sample sentences etc. Some examples have been given above. Many more examples can be found in Part 3.

IDYLL® can also be used for the teaching of foreign scripts. Greek and Russian scripts are too easy and too similar to Latin to require algorithmic treatment, but Sanskrit and other Indian scripts (North and South) and Arabic (and related scripts) can benefit from this approach.

Factual information can benefit from the same approach, both during initial learning and during the revision period. Anything that can be turned into a quiz (presented as stimulus and response) can benefit and ensure that the student walks full of confidence into his exam. Joining separate words in accordance with sandhi rules is an obvious candidate for algorithmic learning, from the first introduction of these rules, up to the ultimate stages when the student has to get them right even in random order. ("No obstacle prevails", if the student applies these methods.)

Subject-matter algorithms are fool-proof procedures which enable a student (or a computer) to convert any given input efficiently and without error into a wanted output. The sandhi rules are obvious candidates for converting from their usual prose or tabular form into subject matter algorithms (Bung and Sánchez 1978). To internalise this procedure, the student is given a large number of examples for each rule. The examples (questions and answers) are written down in the IDYLL® format. The student then practises the exercises in accordance with PAPA, works out the solution for each item by referring to his chart (the subject matter algorithm). He continues doing this, again and again, until he gradually becomes bored with referring to his chart (flow diagram) because he can see the correct answer at a glance and is absolutely sure of it. (Bung 1972, Landa 1968 and 1969)

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The IDYLL® algorithms work well in conjunction with very different teaching methods

The IDYLL® METHOD™ is a comprehensive system for language learning and has a preferred answer or solution for almost any problem or task that can arise. However, not all its components are core components. Some components are recommendations or preferences rather that strict rules. These non-algorithmic components of the IDYLL® METHOD™ are described in Part 2 of this book.

Part 1 deals only with the algorithms. The algorithms themselves are strict and cannot be altered without damaging the system, but they can be combined with almost any existing textbook, course material or approach for the teaching of any language, and make such courses more efficient. It does not matter whether your basic textbook is old-fashioned, or modern, in what sequence the various elements of your language are tackled (even though IDYLL® is very much concerned with programming the best sequences of language elements and has strong preferences in this respect). For all these approaches, PAPA, LASPEX, REV and ENFA can be used to make them more efficient. The algorithms are flexible in this respect. Like any MP3 player which will play any MP3 file, regardless of its contents, The IDYLL® learning algorithms will process any material which has been converted into a question and answer format ("quiz") and laid out in the IDYLL® standard format.

The subject matter can be converted into the IDYLL® format by the teacher or by the student. If it is done by the teacher, there will be fewer mistakes and, once the material has been prepared, many generations of students can benefit from the same materials. If it is done by the students, each student has to do the "quarry work" (see diagram above), year after year, again and again, and some mistakes will inevitably get into the exercises (unless the teacher checks them), but preparing the exercises, bringing the subject matter into the IDYLL® format is useful. It is the first stage of learning for the student, and speeds up initial learning when it starts.

The importance of training

The INSTITUTE FOR DYNAMIC LANGUAGE LEARNING (IDYLL®) offers to conduct courses, workshops, seminars, lectures, for end-users (i.e. language learners rather than teachers), in the UK and abroad, to help them to become more efficient language learners. The Institute also offers consultancy services to schools, etc. We will be glad to hear from interested organisations.

Even if you do not run courses on the IDYLL® METHOD™ for your students, I recommend that you refer them to the website (click: Practical Advice, especially PAPA-BASIC and PAPA) and let them pick out whatever information they want. All the information is free, and is as clear and detailed as I have been able to make it so far. I will continue to improve it.

The only drawback with students relying on the website without attending a seminar or workshop is that they often do not see how stringent the rules are and pick out just a few ideas (with the result that they benefit only 10% when they could benefit 100%) and do not experience even remotely the power of the method, provided it is used exactly.

They will not experience the 90% retention because they do not think that it is possible, and they do not appreciate that adherence to the rules is necessary. My greatest problem with learners (and nowadays I have many of these on the Internet, especially from the Indian subcontinent and from Arab countries) is that, at a distance, I cannot easily induce them to read my articles properly and fully and then to put into practice what they have learnt. They are grateful and think they have benefited but I know very well that they have not benefited as much as they could have done. That's why it is in the interest of students to be trained by an expert who fully understands the system.

Training teachers

Training teachers in the IDYLL® METHOD™ is useful because, if teachers organise their material, handouts and home work in a way that is more closely in keeping with the IDYLL® principles, it will become easier to digest and assimilate by their students. The students have to do less "quarry work" and can devote more time to learning and produce better homework. Moreover preparatory work done by teachers (e.g. preparing homework in the IDYLL® format) can be reused year after year. This therefore means less work and more success for the teachers in the long run.

Training parents

It is also useful to train willing parents together with their children. This will enable the parents to help if a pupil has forgotten or misunderstood one of the IDYLL® rules, or wants to shoot himself in the foot by cheating on the IDYLL® rules. They can keep emphasising to the child the benefits of strict adherence to the rules. Moreover, all members of a family (even at university level) can benefit from such parental training at the school of one child, whatever subject and language they are learning. In brief, training the parents will have great benefits for everybody, the children will learn better, the teachers will have more motivated and successful students and teach better, and the schools will gain in standing and reputation.

Training students

Even training only some students is helpful. If they apply the IDYLL® METHOD™ at home, even in an unchanged school environment, they will soon be able to provide some pleasant surprises to their teachers and the rest of their class. But, obviously, ideally all three parties, students, teachers and parents should be trained.

Table of contents of Part 2 and Part 3 of this book

These are some of the topics which can be included in our workshops.

The IDYLL® METHOD™:

Part 1: Why it works: The theory
Part 2: How to work it: The technical details
Part 3: Sample exercises in the IDYLL® standard format

Part 3: Sample exercises

German vocabulary for English learners
Spanish for German learners
Arabic vocabulary for English learners
Arabic script: Individual letters
IPA into Arabic script
Arabic script: comparison of sounds
Sanskrit: Devanagari script
Tagalog vocabulary
Tagalog: Mastering a dialogue
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Sanskrit: Sandhi
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Latin: Vulgata: Genesis 1
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Benefitting from reading novels and magazines: French example
Subjects other than languages
Chemistry: The periodic table
Kuwait History Quiz
Religious knowledge: Islam: The family of the Holy Prophet
Religious knowledge: Shia Islam: The Battle of Kerbala
Religious knowledge: Christianity: The birth of Jesus
Religious knowledge: Hinduism: The birth of Lord Krishna
Bibliography

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