lamentable one, and one which there is not the slightest justification for leaving unfilled. This has to do with the invention—we use the word though the law denies its propriety—of printed forms for the keeping of accounts or any other purpose.

It goes without saying that much skill and thought may be expended upon the formulation of a set of forms which shall be the last word in furnishing a framework for the proper recording of a certain kind of data. Business of many kinds is dependent upon tabular devices of this sort under one head or another; the invention of such a form may be of great value to its users. It would seem that the man who devotes his time and energy and ingenuity to getting up a thing of the sort ought to be rewarded to the same degree and in the same manner as the man who invents a new safety pin or a novel design for a perfumery bottle or a clever trade-mark. But under the law and the decisions as they now stand he is able to get no protection of any description; you or I or anybody else may manufacture and sell his form in direct competition with him and he has no redress save to undersell us.

The hitch lies in the fact that the law defining invention is so worded that a blank form to be filled in by the user is not an invention. It has no mechanical features, and it is not a process or a product. If the inventor be sufficiently ingenious to design it in such fashion that the user has to punch a hole as part of the process of using it, or join two parts of it in a certain predetermined relationship, or fold the left fifth over upon the right fifth and tear them half off and turn one of them over again in order to bring into juxtaposition two parts of the paper that were originally remote, this constitutes the mechanical feature necessary to make the form stand up under fire as an "invention" entitled to patent protection. But in the absence of such a feature the patent examiners will have nothing to do with it; and if the unhappy inventor turns to the copyright division, he learns that whether his device is an invention or not, it certainly is no publication and he can not protect it by copyright. Even the feeble solace of a design patent seems denied him.

The situation has long been familiar to us. We are inspired to comment on it by a subscriber who shows us a farmers' account book which he has devised. This is an admirable article, and at the same time it fills a want; for the farmer, never an accountant, is required to keep accounts under penalty of paying an income tax on a lot of income that isn't income. But our subscriber can't advertise his little book decently, for if he does some substitute that doesn't have to meet any advertising expense will appear and wipe out his market. We think he has a grievance against the government that tells him that an invention is sometimes an invention and sometimes isn't.—*Scientific American.*

SCIENTIFIC BOOKS

"The Airplane." By FREDERICK BEDELL, Cornell University. D. Van Nostrand Co. Pp. 257.

The theory of flight has more than kept pace with the development of the airplane. It is possible, on the basis of constants determined in wind tunnels, to predict very closely the performance of an existing airplane or to design a plane for some desired performance. The fundamentals of this theory of flight are embodied in a number of recent treatises and are readily available to the student. In Bedell's work they are not only available but are presented in so attractive and understandable a form as to compel the interest of the reader. The present reviewer has read the book through twice, for the pleasure of following so masterly a presentation. Everything is reduced to its simplest terms; every idea is driven home; the influence of each element is illustrated by a series of graphs; the whole subject seems to develop itself. It is a book for the amateur, but it is also the best of beginning books for the serious student. And it explains so convincingly many things which are troublesome to the beginner, as for example, why can not speed be increased in level flight

merely by opening the throttle, as in the case of an automobile.

Professor Bedell's book shows an unusual gift for clean cut analysis and exposition; there are but few scientific or technical books that demonstrate these qualities in so high a degree.

The book does not attempt to extend the science of aeronautics. It is devoted primarily to a discussion of the problem of sustentation; the matter of stability is also treated, but in a qualitative way. It falls in a category between the popular book, superficial and inadequate, and the treatise, involved, and complicated. It is a book destined for a long and useful life.

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SPECIAL ARTICLES

A FURTHER NOTE ON WAR AND POPULATION[1]

In a note published last summer[2] I drew attention to the course of the ratio

$$\frac{100 \text{ Deaths}}{\text{Births}}$$

in the principal belligerent countries of Europe between 1913 and 1918. All of the curves presented, with the single exception of that for Prussia, ended on a high point in 1918. The question was raised as to what would be their course after that year, and it was shown that England and Wales gave a value of 73 per cent. for 1919 against 92 per cent. for the high point in 1918. The first three quarters of the year 1920 give for England and Wales a value of 46.8 per cent. This is 10 points *lower* than the figure for 1913! For every death England had more than two births.

The *Journal Officiel* has recently published the 1919 figures for France (77 non-invaded departments only) to the following effect:

$$\frac{100\ D}{B} = \frac{63569400}{413379} = 154 \text{ per cent.}$$

This figure compares (for the same territory) with 198 in 1918, 179 in 1917, 193 in 1916, 169 in 1915, 110 in 1914, and 97 in 1913. In other words, in the next year immediately following the cessation of hostilities France's death-birth ratio came back to less than that of 1915, the first whole year of the war. With an increase of 157 per cent. in marriages in 1919 over 1918 there seems little risk in predicting that 1920 will show a ratio not far from 100, which will be about the normal prewar status, France having had for some time a nearly stationary population. The 1920 vital index for France may well prove to be considerably below 100.

Another, and even more striking illustration of the exceedingly transitory effect of war upon the rate of population growth, is seen in the figures for the City of Vienna. Probably no large city suffered so severely from the war as did this capital. Yet observe what has happened, as set forth in Table I. To this table I have added, for the sake of rounding out the data of this and the former paper, the death-birth ratios of the United States Registration Area for as many years as they are available, and for England and Wales, 1912 to 1920 (first three quarters of latter year).

TABLE I

Percentage of Deaths to Births

Year	City of Vienna	U. S. Birth Registration Area	England and Wales
1912	80	—	56
1913	85	—	57
1914	86	—	59
1915	113	56	69
1916	143	59	65
1917	195	57	75
1918	229	73	92
1919	162	58	73
1920	—	—	47[3]

These figures are shown graphically in Figure 1.

We note that:

1. The high point of the Vienna curve in 1918, 229 per cent., is higher than that for France (198 per cent.), and probably higher than for any other equally large aggregate of population in the world.

[1] Papers from the Department of Biometry and Vital Statistics, school of hygiene and public health, Johns Hopkins University, No. 27.

[2] Pearl, R., Science, N. S., Vol. LI., pp. 553–596, 1920.

[3] First three quarters of year only.