but 0.2 above the pre-war five years' average. The infantile mortality rate was 58 per 1,000 births. It is 6 below that for the second quarter of 1942 and 10 below the five years' average. It is the lowest rate recorded for the second quarter of any year. The maternal mortality was 3.5 per 1,000 live births.

DISCUSSION

GEOLOGISTS IN WAR SERVICE

THERE has been some recent discussion in SCIENCE concerning the utilization of geologists in the war effort. Very few geologists are satisfied that the full value of the profession or of its personnel is appreciated. However, there has heretofore been an almost complete lack of information on which to base an intelligent discussion. Information on the prewar and wartime occupations of Harvard-trained geologists has been gathered. Data on 318 men are available, as shown in Table I.

TABLE I

Degrees	Total number	Teaching Per cent.	Non-commercial and government research Per cent.	Commercial research Per cent.	Changed position as result of war Per cent.
Ph.D. and S.D.	115	50	14	32	28
M.A. } M.S. } M.E. }	79	32	18	46	32
Graduate School— no degree	73*	31	37	31	44*
A.B. and B.S.	51†	12	63	25	35
Totals	318	34	33	33	33

* Of this total 22 were students in 1941–42 and are omitted in calculating percentages, except in the final column.

† The present occupations of 93 other men with A.B. and B.S degrees are known. These men have gone into occupations other than geology or into the Army, and are not here listed.

Of the total of 318, a third each are employed as teachers, in non-commercial and governmental research and in commercial research. Only two of the teachers are in preparatory work; the rest are in college teaching. The per cent. of Ph.D.'s in this category is the highest, as men planning to teach usually attempt to doctorate. Many of those who have A.B. and A.M. degrees from Harvard hold doctors' degrees from other institutions.

The impact of the war has been severe, and there has been a shift of employment involving 33 per cent. of the total. The shift has been from commercial research into governmental research and administration or into the Army and Navy. Teachers have shifted mostly into commercial research, but most of the teachers have not shifted employment. They have, however, changed courses and adapted their teaching to new demands. Many have spent much time in temporary work for governmental bureaus or in commercial work or strategic minerals. It has been impossible to make estimates of these informal, confidential and part-time efforts, although their total value is large.

The proportion in the Army and Navy is fairly high: 10 doctors; 11 masters; 17 men with graduate work, and 5 bachelors who are recognized geologists or 13.5 per cent. of the total. Students who left college with bachelors' degrees to go directly into the Armed Forces are numerous but not considered. Some of these men intend to be geologists and have adequate training to be useful field assistants.

Of the group in uniform, 17 are mature men who are in specialized positions of research and administration which appear to be suitable to their talents. Men under 40, however, are mostly performing ordinary military or naval duties, for which they are presumably qualified, but which seem below their capacities. Every geologist believes that the Army and Navy need geologists as advisers on construction and on tactics and strategy. If these men were used as geologists, the situation would be more satisfactory. There are also others qualified and willing who could be recruited for duties in military geology.

These data cover the wartime changes in the occupation of a small group only, but a group presumably representative of the geologists who have graduated from other universities. The willingness of geologists to leave their ordinary occupations and assume new duties is obvious—a third have done so. That others are willing may be assumed. It appears, however, that a considerable fraction already in uniform are not being used to the best advantage. Many hesitate to change from one civilian position to another, but would shift to a uniform if they were to be used in a geologic staff.

KIRK BRYAN

CAMBRIDGE, MASS.

APPARENT TIME ACCELERATION WITH AGE

I AM interested in the article on "Apparent Time Acceleration with Age of the Individual," by F. W. Nitardy, appearing in SCIENCE for July 30. The theory set forth is "that elapsed time as measured by the recollection of an individual seemed long or short according to what relationship it had to the individual's total time experience." What is meant of course is a limited period of time in relation to the total time experience.

While the abstract lapse of time is a constant fac-

tor, it is not the only factor. The content of the lapsed time, that is, the events, occurrences, incidents and circumstances experienced during the period of lapsed time, is also a factor. Indeed, it would seem that it is more important than the mere lapse of time.

When the items of the content are new and strange, they appear to be longer in passing than when they are more or less familiar, even though they pass during the same period of time. It is well recognized, for example, that when one takes a first trip of an hour over a road new to the observer, it seems to the observer to take much longer than the same trip does at subsequent times. Also, when the items of the content are reduced to a minimum, as when one remains wakeful in a room for an hour with nothing to do, it seems a very long hour indeed.

The longer one lives the more familiar one becomes with many items which help to form the content of the lapse of time. Consequently, when the more or less familiar items pass in review, it seems to take them a shorter time than it seems to take at the beginning of life when everything is new.

If I remember correctly, some one once asked the late President Harding what phase of the Presidency impressed him most, and that his reply was the degree to which all his experiences in life prior to the Presidency were crowded out of his memory. In other words, because of the many and important items in the content of the lapse of time, a year as President seemed much longer than a year of his childhood then seemed.

It may also be observed that a brief period of danger may seem to be very long. I have heard it stated by boxers who were afraid of being knocked out that a round of the fight seemed like an age. It would appear that the content of the period of time is far more important than its actual length or than the ratio of the period to total elapsed time, in determining how long it seems to the observer.

PETER T. DONDLINGER

IN the issue of SCIENCE for July 30, 1943, F. W. Nitardy, proceeding from the assumption that as one grows older time seems to pass more rapidly, offers the ingenious explanation that each year has an apparent length inversely proportional to the number of years already stored in one's memory.

The assumption itself needs to be qualified; for there are at least limited circumstances in which the time-lapse sensation does not depend chiefly on age. A man of sixty and one of twenty, suffering extreme hardships on a life raft, expect to be rescued in due course. Is time likely to drag for Mr. Twenty but to plunge headlong for Mr. Sixty? Or consider a class one month before the end of the spring term. Pupil Twenty is to take some terrifying examinations and then to work on a job he loathes; and teacher Sixty will depart on a grand tour to which he has looked forward many years. Does age determine which wants a particular unit of time to creep and which to gallop? Some of Shakespeare's relevant observations are, of course, to be found in the second scene of the third act of "As You Like It."

To the extent that the assumption is sound, additional considerations for the subjective shortening of time are discernible. In one's earlier years there are apt to be numerous events (say, dates of parties, holidays, school graduations, marriage, childbirth, promotions) awaited so eagerly that one would be glad to forego the intervening period. After middle life, comparatively few such occasions remain, to be summoned posthaste out of the future. With the overwhelming distractions largely behind us, we are better able to appreciate time, and begin to concern ourselves with its pace.

Moreover, while our interests and associations multiply and we are troubled continually by the awareness of our multifaceted ignorance, the increasing disproportion between the innumerable things we ought or want to do and the few for which we shall have opportunity brings us to the unpalatable realization that time is shrinking.

Above all, there is the factor of apprehension. A decade ago the expression "Life begins at 40" was popularized by a book of that name. Whatever consolations the author may have adduced to support the title, realists know that at forty life begins to end, that they have then gone over the top of the hill and are coasting, brakeless, toward extinction. This is doubtless the primary reason why we oldsters are so dismayedly conscious of the precipitateness with which the years, months, weeks and days vanish. When young, we acted as if our balance in the bank of time were inexhaustible; we can delude ourselves no longer.

FRANK WILEN

BROOKLYN, N. Y.

FOR the apparent speed-up of time with increasing age of the individual, F. W. Nitardy (in SCIENCE, July 30) has a plausible explanation, perhaps the correct one. Other theories are possible. Shakespeare observed the facts even more broadly : witness the duet between Rosalind and Orlando:

"Time travels in divers paces with divers persons" . . . .

"Who does he gallop withal?"

"With a thief to the gallows."

Balzac, in "Le Peau de Chagrin," shows impressively how to youth the inevitable end is a philosophical conception rather than one of the "facts of life," while as the aged approach that end the apparent

speed of passage approaches the infinite. Youth looks forward and would "hasten the day"—of a party, of marriage, of economic competence. Age also looks forward, but to a constantly closer door never willingly approached. The apparent speed of time is warped in a direction opposite to that preferred. To youth it seems to move slowly, because youth would have it move rapidly. To age it seems to move rapidly because age would wish it to move slowly.

Or, to suggest another theory, we tend to measure the speed of time in terms of activity. Youth, on the average, is a period of limited interests and few internal resources. For the child, occupation must be found by some one else. He is easily and often bored. Time goes slowly with him. The adult has so much to do and think that time is never sufficient. It gallops away. Even the senile are fully occupied with issues of comfort and repose which are increasingly of concern to them. Thus time slips by with invisible swiftness.

W. D. ENNIS
STEVENS INSTITUTE OF TECHNOLOGY

FURTHER NOTE ON RUSSIAN NAMES

THE scientific worker with the problem of transliterating Russian names or identifying those transliterated by others will have been gratified by the recent attempts of Drs. Hrdlička (SCIENCE, 97: 243) and Dunlap (SCIENCE, 97: 400) to secure the adoption of a uniform method of transliteration. Certain points, however, need further clarification.

Dr. Dunlap's suggestion that we should be sensible and write "Павлов" as Pavloff" conforms neither with Dr. Hrdlička's recommendations nor with the accepted practice of transliterating into English letters most nearly representing the sounds of the Russian letters. In this case the final consonant in each syllable is the Russian "B," which equals the English "v," and "Pavlov" is the only correct English rendition possible.

When the initial of a Russian name is incorrectly transliterated in a bibliography or file, the reference appears at an incorrect position in the alphabetical arrangement and may be all but lost. "Vavilov" may be found misplaced as "Wawilow," or "Yarkina" as "I͡arkina" or "Jarkina."

The other Russian letters which are most frequently transliterated with confusing results are: "E," equal to the English "ye," as in "yet," with the English "e" reserved for "э"; "Ж," transliterated "zh" and pronounced as the "s" in "measure"; "И," equal to the English "i" and not "y"; "Ц," equal to the English "ts" and not to the German "z"; "Ю," equal to the English "yu" as in "yule"; and "Я" equal to the English "ya" and not the awkward "i͡a" nor the German "j." For the Russian "Ц," the English "ch" as in "cherry" is adequate, is in customary use and retains English characters, available in all printing establishments, in contrast to the Slavic "č." (This note is restricted to Russian transliteration to avoid the dilemma of inconsistency on the one hand or, on the other, questioning of the right of so eminent an authority as Dr. Aleš Hrdlička to his preferred and long-established spelling of his own name.) There seems to be no alternative but that "Щ" be rendered as "shch," clumsy as that may seem, while the Russian "Х" is best transliterated as "kh" and aspirated as the German "ch" in "Bach." Had the Waterloo of this summer's Eastern front been properly rendered as "Oryol," we might have been spared some of the heroic but painful linguistic struggles of our radio commentators.

K. STARR CHESTER
OKLAHOMA A. AND M. COLLEGE,
STILLWATER

THE DIET OF CHINESE SOLDIERS AND COLLEGE STUDENTS IN WARTIME

A BRIEF account of the monotonous and simple diet of Chinese soldiers, with the diet of Chinese college students for comparison, will be given in these notes. The information may be useful for those working for practical nutrition and provoke thoughts of those who are interested in the science of human nutrition.

Based upon the 1,178 rations issued in 124 messes in South China in the spring of 1940 and the food consumption data of 11,338 soldiers for a month, a basic ration has been formulated. It consists of 953 grams of rice, 274 grams of leafy vegetables, 10 grams of fat and 13 grams of salt.

The ration provides probably enough calories for an adult having physical work, enough protein, nearly all from rice, and a very small amount of fat, which furnishes less than 3 per cent. of the total calories of the diet. It supplies sufficient iron, barely enough calcium and too much phosphorus from rice, thus with a Ca : P wider than 1 : 4. In regard to vitamins, it is worthy of note that practically only from the 274 grams of leafy vegetables the soldier gets his vitamin A in the form of carotene and vitamin C; and from the rice bran left on the low-grade rice he gets his antiberiberi vitamin. The actual vitamin intake can not be estimated correctly because of lack of analytical data and loss of vitamins through cooking.

The efficacy of this ration has been reflected on the nutritional state of soldiers based upon the measurements of 3,298 of them. Their height-weight relationship is just about normal for the average southern Chinese. According to medical examinations of the soldiers, the incidences of vitamin B deficiency are higher in those groups where polished rice is used or the rice water is wasted. It has been found that new