venience of those who have to read their descriptions. This recommendation will be of great aid in identifying species and genera and will help towards that end when men will see there is honor in furnishing good diagnoses, but no honor in simply naming species.

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June 4, 1907

ANOTHER WORD ON THE VULTUR CASE

MY brief allusion to Dr. Allen's inconsistency in his latest elimination of *Vultur* seems to have been clear to all with whom I have discussed the question except Dr. Allen, who fails entirely to see my point.

It seems necessary, therefore, to restate the matter. The case is as follows:

Sarcorhamphus 1806.
gryphus.
papa = type of Gypagus 1816.
auricularis = type of Torgos 1828.
Cathartes 1811.
papa = type of Gypagus 1816.
aura.
Gypagus 1816.
papa.
gryphus = type of Gryphus 1854.

Dr. Allen says that while *gryphus* is the type of *Sarcorhamphus* it was not the type in 1806 and only became so in 1828 by the removal of the other species. Therefore, he claims that in eliminating *Vultur* we have no right to remove *gryphus* at 1806 and can only remove it at the date at which *it became* the type of *Sarcorhamphus*.

This is absolutely contradictory to his own practise in all other cases, nor can I find a precedent in the "current usage" of other eliminators. For instance, *papa* is the type of *Gypagus* 1816, but it was not the type in 1816, and only became such in 1854; and yet Dr. Allen in all his eliminations removes *papa* at 1816, which any one can see is the date of establishment of the genus, not the date at which *papa* became its type. To be consistent *gryphus* must, of course, be removed at 1806, as I stated previously. Dr. Allen's recent note in which he repeats that *papa* must be removed at the date at which its genus was established, while *gryphus* must be removed at the date it became the type of its genus, only emphasizes his inconsistency—an inconsistency which is too self-evident to require the employment of any "imagination."

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May 24, 1907

SPECIAL ARTICLES

RELATION BETWEEN BIRTH RATES AND DEATH RATES

A SHORT notice appeared on page 641 of SCIENCE, 1907, of a paper read by C. E. Woodruff before the American Association for the Advancement of Science, on the relation between birth rates and death rates, etc.

In this connection, it may be of interest to note that a mathematical expression can be obtained for the relation between the birth rate per head b and the death rate per head d, for the case where the general conditions in the community are constant, and the influence of emigration and immigration is negligible.

Comparison with some figures taken from actual observation shows that these at times approach very nearly the relation deduced on the assumptions indicated above.

I give here the development of the formula, and some figures obtained by calculation by its aid, together with the observed values, for comparison.

Let $c(a)$ be such a coefficient that out of the total number N_t of individuals in the community at time t, the number whose age lies between the values a and $(a+da)$ is given by $N_t c(a)da$.

Now the $N_t c(a)da$ individuals whose age at time t lies between the values a and $(a+da)$, are the survivors of the individuals born in time da at time $(t-a)$.

If we denote by $B_{(t-a)}$ the total birth rate at time $(t-a)$, and by $p(a)$ the probability at its birth, that any individual will reach age a, then the number of the above-mentioned survivors is evidently $B_{(t-a)}p(a)da$.

Hence:

$$N_t c(a)da = B_{(t-a)}p(a)da$$