

Several additional bodies are strongly suspected of being still other phases of this pleomorphic parasite : *E*-bodies are intensely chromatic, torula-like, and can readily be confused with pyknotic nuclei or nuclear fragments. *H*-bodies are composed of chromatin and cytoplasm, the former with bipolar, tri-polar or quadripolar distribution. They are likely to be dismissed as cells undergoing karyorrhexis. Possible filamentous phases are also being studied. Full descriptions, including details of the distribution in the tissues, will be published elsewhere.

I believe that glioma of the fowl will prove to be nothing but a proliferative response to a specific infectious agent.

These findings led me to approach Dr. R. A. Krynauw, head of the Neurosurgical Department of the Johannesburg Hospital, for collaboration in the task of ascertaining whether they have application also to gliomas of man. Results have been obtained which will be communicated in the near future.

CECIL JACKSON
Onderstepoort Veterinary Research Institute.
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¹ Belmonte, V., *Virch. Arch.*, 294, 329 (1935).

² Jackson, C., *Onderstepoort J.*, 6 (1), 458 (1936).

³ Jungherr, E., and Wolf, A., *Amer. J. Cancer*, 37, 493 (1939).

Shrivelled Wheat Grain from Rust-Affected Crop as Seed

In the Central Provinces and Berar and other regions in peninsular India, recurrent damage is caused to the wheat crop by black stem rust, *Puccinia graminis tritici*. In some years, as in 1946, the destruction of the crop is so great as to result in an acute shortage of seed. To investigate the possibility of utilizing the shrunken grain produced by the rust-affected crop, as seed, germination tests of, and experiments to observe the effect on yield of sowing, such grain were carried out.

Samples of shrivelled grain were obtained from different places and individually sorted into three grades according to grain size : medium, thin and very thin grains. Percentages of each grade in a sample and its 1,000-seed weight were ascertained before testing viability of the grain. Due to high weather temperature (about 115° F.) and for want of a refrigerator at this Station, germination tests were carried out in small earthen pots filled with sand and clay. The pots were partially buried in wet sand and kept in a cool room during the day, and removed to the open towards evening. The

TABLE 1. SUMMARY OF THE RESULTS OF GERMINATION TESTS
(Figures represent the mean for the number of samples tested per lot.)

Lot No.	Number of samples tested	Percentage of grades*	1,000-grain weight in gm. of grades†			Germination percentage of grades		
			A	B	C	A	B	C
1	24	19 68 13	18.5	10.9	5.3	79	63	33
2	20	34 58 8	15.3	8.9	3.8	84	80	66
3	11	16 70 14	18.4	10.5	5.1	97	79	62
4	30	27 66 7	16.5	8.6	3.7	94	90	81
5	15	33 56 11	17.9	10.4	4.1	80	81	74
6	9	36 41 23	14.7	8.7	4.6	86	78	71
7	6	41 53 6	22.0	11.2	4.7	69	58	41
8	5	35 57 8	18.0	11.0	5.2	65	51	37
Average of 120 samples		30 59 11	17.7	10.0	4.6	82	73	58

* Grade A = medium grain; Grade B = thin grain; Grade C = very thin grain.

† 1,000-grain weight of normal wheat grain of the varieties tested varies from 36 to 40 gm.

TABLE 2. YIELD OF GRAIN (CALCULATED) PER ACRE (IN LB.)					
Year	Variety	Shrivelled seed	Normal seed	Difference	Percentage loss
1944-45	<i>A</i> 115	377	864	487	56.3
	<i>A</i> 090	461	755	294	38.9
	<i>N.P.</i> 52	472	588	116	19.6
Average		(S.E. 64.7 ; C.D. 188.7)		299	38.3
		(S.E. 37.4 ; C.D. 108.9)			
1945-46	<i>A</i> 115	693	1205	512	42.5
	<i>N.P.</i> 52	701*	1092	391	35.9
Average		(S.E. 94.7 ; C.D. 285.3)		452	39.2
		(S.E. 66.9 ; C.D. 201.7)			

Critical difference (C.D.), at $P = 0.05$. The differences are statistically significant.

* There was considerable damage to the plants by termites in these plots.

results of 120 samples thus tested are summarized in Table 1.

In order to observe how the crop grown from shrivelled grain would compare with that from normal seed, particularly in respect of yield, the two kinds of grain of three varieties, *A*090, *A*115 and *N.P.*52, were sown in plots, each 10 in. \times 7½ in. in size and replicated six times. In the subsequent year, the trial was repeated but with the last two varieties. In both years the early growing period was dry and devoid of rain, resulting in seedling mortality which was approximately 20 per cent greater in plots sown with shrivelled grain. Plants from the normal seed were superior in growth, vigour and tillering. The yields obtained are shown in Table 2.

The results of germination tests indicate that shrivelled grains obtained from the rust-affected wheat crop are tolerably suitable as seed, particularly if the very thin grains are sorted out and rejected. From the point of view of yield, however, sowing such grain would lead to a loss of about 40 per cent as compared to that of the normal seed crop. As the seasons during which the trials were conducted were very adverse, it is probable that the loss would be less under favourable weather conditions. In the present circumstances in India, when good seed is not available, the possibility of importing it from outside is remote and the necessity of growing food crops is supreme, recourse could be taken to the use of shrivelled grain as seed.

R. B. EKBOTE
K. R. SAHASRABUDDHE

Wheat Research Station,
Powarkhera, Hoshangabad,
Central Provinces.

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Recent Climatic Fluctuations

SOME researches have been carried out in order to elucidate recent climatic fluctuations. Maps have been constructed, showing for the whole earth : (1) the extension of severe winters and mild winters, cool summers and warm summers, cold years and warm years ; and (2) the difference $T_{(1881-1910)} - T_{(1881-1910)}$, $R_{(1881-1910)} - R_{(1881-1910)}$ and $P_{(1881-1910)} - P_{(1881-1910)}$ respectively ; T , R and P are the normals of temperature, rainfall and pressure for the periods 1881-1910 and 1911-40, January, July and year.

Temperature-, rainfall- and pressure-curves have been worked out for 10-year means and overlapping 30-year normals respectively.

Certain regions seem to be connected in respect of climate, in that considerable positive or negative correlations can be found between the departures from the mean winter- and summer-temperature at the meteorological stations in these regions.