case and by a 300-second in the other, but not by a 42-second filter, it is concluded that the removal was accomplished by sieving rather than adsorption. On the other hand, the removal of the pyrogen by the Seitz Serum No. 3, because of the nature of the filter, is by adsorption. Smith and his associates[7] have devised a method of purifying crude, toxic inulin into a non-toxic one with charcoal, probably utilizing the known adsorbing power of the latter substance.

Since after the treatment with charcoal by the Smith method, and after filtration through membranes as well as through an adsorptive filter, inulin can be injected into man and dogs without any symptoms, it is clear that the results obtained by Hanzlik and Karsner in the guinea pig are not reproducible in the human being or in the dog. The question arises whether the symptoms elicited by Hanzlik and Karsner as well as by Nathan and by DeKruif and German were not due to an artefact instead of to inulin itself.

Summary and Conclusions. 1. The febrile reaction elicited by intravenous injections of some samples of inulin is similar to that following the intravenous administration of pyrogenic infusion fluids in both dog and man. 2. The pyrogen in the inulin as well as that in the pyrogenic infusion fluid is filterable through a Berkefeld filter, but held back by filtration through 2 Seitz Serum No. 3 filter pads and by Zsigmondy membrane filters of from 200 to 300 seconds. 3. The pyrogen in inulin, like that in pyrogenic infusion fluids, is therefore of a particulate nature of a large order of magnitude. It is likewise adsorbable.

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Phosphorus Metabolism. VII. Course of Phosphorus in Alimentary Tract of the Rat.

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The main object was to compare the concentrations of total P and its fractions in the stomach contents, small intestinal contents, large intestinal contents and colon, and feces, on a P-free diet, with the concentrations on a normal diet. This should indicate some changes taking place, particularly to what extent P compounds are excreted

[7] Smith and associates. Personal communication.

TABLE I.
Phosphorus Content and Distribution in the Alimentary Canal Contents of Rats on a Normal Diet and on a P-free Diet.

	Phosphorus in Contents						
	Total	Lipid		Organic Acid-soluble		Inorganic	
	mg. %	mg. %	% of total P	mg. %	% of total P	mg. %	% of total P
Average for Normal Diet							
Stomach	77	7.3	10.9	41	51.1	19	25.4
Small intestine	148	10.2	7.1	17	14.4	117	77.5
Large "	741	8.2	1.2	195	25.9	394	53.7
Average for P-free Diet							
Stomach	31	4.3	12.2	7.7	47.3	—	—
Small intestine	167	15.0	8.9	8.2	5.5	121	72.2
Large "	164	9.4	6.2	22.2	14.6	87	52.6

TABLE II.

Content and Distribution of Phosphorus in Intestinal Mucosa of Rats on a Normal Diet, a P-free Diet, in Fasting, and on High-fat and Low-fat Meals.

Exp. No	Diet	Phosphorus								
		Total	Lipid		Organic acid-soluble		Inorganic		Residual or "Protein P"	
		mg. %	mg. %	% of total P	mg. %	% of total P	mg. %	% of total P	mg. %	% of total P
1	Normal	391	42	10.6	61	15.5	158	40.3	131	33.6
2		349	49	14.0	53	15.3	146	41.8	101	28.1
3		374	47	12.4	66	17.5	150	40.1	112	30.0
4		344	45	13.1	45	13.1	129	37.4	125	36.3
5		371	30	8.1	52	13.9	183	49.4	106	28.5
6	24-hr. fast	394	44	11.3	73	18.7	129	32.8	147	37.3
7		351	44	12.4	59	17.2	125	35.1	124	34.4
8	High-fat meal after 24-hr. fast	336	46	13.7	62	18.8	121	35.8	107	32.2
9		368	59	15.9	96	27.5	120	32.5	93	24.1
10	Low-fat meal after 24-hr. fast	385	38	9.8	71	18.3	161	41.6	116	30.3
11		389	34	8.7	64	16.9	150	38.1	142	36.4
12	Phosphorus free	383	51	13.4	61	15.9	179	46.8	91	23.8

into the alimentary tract not only by the saliva, gastric juice, bile and pancreatic juice, but also by the intestinal wall.

The "P-free" diet consisted of the following:

Starch-agar (32-1)	69
Gelatin	9
Egg albumin	9
Butter	10
Cod liver oil	1
Salts ($CaCO_3$ 1, NaCl 1)	2

It was found to contain 50 mg. % total P, 2.5 mg. of which were in phospholipid form. There was only a trace of inorganic phosphate.

Groups of 3 rats each were kept on the diets for one, 2, and 3 weeks; they were then killed and the different contents named above were analyzed for total P, and lipid-, organic acid-soluble-, and inorganic-P. Table I summarizes some of the results.

When the maximum amount of P coming from the saliva, gastric juice, bile and pancreatic juice was calculated for each period it was found that there was still a considerable excess of P in the feces for each corresponding period, even though no reabsorption from the above secretions was assumed. This indicated that P compounds, particularly phospholipids and inorganic phosphates, were excreted into the lumen through the wall. This is in harmony with the recent work of Shapiro, Koster, Rittenberg and Schoenheimer,[1] which showed that fecal fat in man originated to a large extent by secretion into the intestinal lumen.

Later the intestinal mucosæ of other similar rat groups were analyzed for the same P compounds under a normal diet, a 24-hour fast, 6 hours after ingesting a high-fat meal, and 6 hours after ingesting a low-fat meal. Table II presents the results.

Conclusions. There is a considerable secretion of P compounds into the intestinal lumen through the wall. This holds not only for phospholipids but particularly also for inorganic phosphates.

The intestinal content does not show any decided change in the concentration of total P, organic acid-soluble- or inorganic-P, on the different diets or when fasting for 24 hours. The concentration of lipid P, however, is just definitely higher on the high-fat meal, and definitely lower on the low-fat meal.

[1] Shapiro, A., Koster, H., Rittenberg, D. and Schoenheimer, R., *Am. J. Physiol.*, 1936, **117**, 525.