

REVIEW OF 1000 CONSECUTIVE CASES OF IRRITABLE COLON; ITS SIMULATION OF SURGICAL CONDITIONS AND TREATMENT

E. N. COLLINS, M. D., and H. S. VAN ORDSTRAND, M.D.

The irritable colon syndrome would not be so important if medical management only were used in its treatment. Although it is well known that the symptoms may simulate any organic disease in the abdomen, we found in a series of 1000 consecutive cases that 302 operations had been done in 204 of the patients. In addition to presenting analyses of these cases, we shall attempt to clarify certain controversial features and to present certain principles of treatment.

The high incidence of this disorder as a cause of abdominal discomfort and pain warrants greater recognition than it has received in the past. The cases on which this report is based were observed during a period of only two years.

DEFINITION

Irritable colon (spastic irritable bowel¹, unstable colon², functional bowel³, mucous colic⁴, mucous colitis⁵, etc.) is considered to be a hyper-irritable neuromuscular imbalance of the colon, *sufficiently severe to cause abdominal distress*. Although this condition may not shorten life, it can cause years of suffering, if not invalidism, and result in malnutrition either from the patient's elimination of essential foods in the diet, from change in gastrointestinal secretions, or from lack of absorption because of changes in motility, or a combination of various factors.

Many persons have either simple constipation or diarrhea for years without having abdominal distress. The term, "irritable colon," is *not* applied in these instances. It is true that patients having irritable colon commonly complain of constipation or diarrhea but neither may be present. In other words, this entity must be responsible for the patient's abdominal distress, regardless of bowel habits.

The symptoms may refer to any or all parts of the colon. Associated symptoms may refer to other parts of the digestive tract, if not to various parts of the body. Most commonly they shift from one part of the abdomen to another, across the lower abdomen, or are localized in the left lower quadrant. However, they may be localized in the right lower quadrant, simulating appendicitis; in the right upper quadrant, simulating cholecystitis; or in the epigastrium or left upper quadrant, simulating organic disease of the stomach or duodenum. Also, because of colonic distension in the left upper abdominal quadrant, the symptoms may be interpreted as cardiac disease. At the time of their initial visit some of our patients had a profound cardiac neurosis or diagnosis of "irritable heart" had been made.

An important feature is the fact that there is a lack of remission of symptoms since the date of their onset. In the present series the symptoms were present at least every week during a period (average) of eight years. It is well known that in true inflammatory disease of the digestive tract, such as peptic ulcer, biliary disease, acute appendicitis, or nonspecific or indeterminate ulcerative colitis, there is usually a history of complete remissions of symptoms over months if not years of time. In neoplasms of the digestive tract the relatively short continuous duration of symptoms (three to eighteen months' average in our experience) at the time the physician is first consulted, is noteworthy.

The symptoms may be related chiefly to colonic function, but there often is evidence of associated dysfunction in the small intestine or stomach, such as the hyperacidity syndrome, without the periodic remission of symptoms observed in patients having peptic ulcer.

DIAGNOSIS

The diagnosis can accurately be made only by the process of exclusion. All the local, systemic, and reflex organic causes for colonic spasm or dysfunction must be excluded, as mentioned in Table 1⁶. As in the case of any functional disturbance, if the patient follows the prescribed management and does not obtain satisfactory results, the physician must continue to make follow-up studies to convince himself, as well as the patient, that no organic disease exists.

A comprehensive discussion pertaining to differential diagnosis is beyond the scope of this report. Renshaw⁷ has presented observations which apply to many of the conditions mentioned in Table 1. It would appear that extensive examinations must be made in every instance

TABLE 1
IRRITABLE COLON

The diagnosis is made only by the process of exclusion.

1. Exclusion of organic disease in the colon. History, physical, including digital rectal examination. Stool, proctosigmoidoscopic, and roentgenologic examinations.
2. Exclusion of extracolonic disease, which may cause a toxic or reflex influence on the colon.
 - (1) Intra-abdominal: peptic ulcer, biliary disease, tumors, gastritis, achlorhydria, pancreatic disturbances, regional enteritis or "terminal ileitis," urinary tract disease, uremia, renal colic, etc.
 - (2) Extra-abdominal: systemic diseases, pulmonary disease, tuberculosis, lesions of central nervous system, syphilis, etc.
3. Deficiency states: self-restriction of foods, food faddists, sprue, pellagra, etc.
4. Endocrine: thyroid disturbances, menopause, premenstrual, etc.
5. Gastrointestinal allergy.

1000 CONSECUTIVE CASES OF IRRITABLE COLON

before a reasonable "working diagnosis" of irritable colon may be permitted. This need not apply unless the presenting symptoms refer to many parts of the body. If the patient has symptoms pertaining to the urinary tract, as well as to the colon, adequate examination of the urinary tract must, of course, precede other investigations. The presence of a urinary calculus may be the cause of reflex spasm in the colon. Disease in the colon cannot be excluded without stool, proctosigmoidoscopic, and roentgen examinations of the colon. A search for parasitic infestation is included in the stool examinations. The patient is given a saline cathartic before breakfast and reports to the bacteriologist immediately thereafter. The liquid stools are examined on a warm microscopic stage as soon as passed. Routine stools are examined for evidence of sprue and other evidence of abnormal digestion. The indication for other special examinations obviously depends on a careful analysis of the symptoms presented by the patient. The local, systemic, and reflex organic causes for colonic dysfunction must always be kept in mind.

In Table 2 is shown the types of the 302 operations done in 204 of the 1000 consecutive cases of irritable colon.

TABLE 2
IRRITABLE COLON
(1000 Consecutive Cases)

OPERATIONS: 302 in 204 patients without any change in symptoms

Appendectomy	163
Biliary tract	38
Pelvis (partial)	38
Pelvis (complete)	35
Gastrointestinal tract	25
(for ulcers, adhesions, enteritis, etc.)	
Genitourinary tract	3

At the time of our examination, these patients stated that they had precisely the same symptoms they had before operation. Many of the patients had had multiple operations, several as many as six. Although other indications for operations may have been present, the patients stated that their chief trouble was not relieved. As far as any patient was aware, none of the 302 operations was preceded by fever or jaundice. Partial and complete pelvic surgery is differentiated in the table only as to the degree of surgery, the complete resulting in surgical menopause.

CASE REPORTS

Case 1: A woman, aged 37, had suffered attacks of pain in the lower right abdominal quadrant over a seven-year period. She stated that the onset followed a pregnancy, at which time a chronic gaseous dyspepsia developed and she started a daily cathartic habit. Two years later an exploratory operation was done, the appendix removed, an ovarian cyst "punctured," and "cecal adhesions" freed. Subsequently there was no relief of symptoms. A second operation was per-

formed in the same region, "adhesions" freed, and a partial hysterectomy performed, again without relief of symptoms. A complete examination including urologic, as well as gastrointestinal investigation, was done but no evidence of organic disease was found. Management for irritable colon was instituted. She was observed at intervals over a period of two years and is known to have remained symptom-free at least during that period of time.

Discussions of other criteria which established the diagnosis of irritable colon in these three cases will follow.

Case 2: A 61 year old housewife had experienced attacks of nausea, vomiting, and pain in the right upper abdominal quadrant requiring hypodermic relief over a period of twenty-three years. She dated the onset of these symptoms soon after a pelvic operation, at which time a bilateral oophorectomy, right salpingectomy, appendectomy, and uterine suspension were done with subsequent menopause. She had experienced lifelong constipation with the self-use of daily cathartics.

Twenty years prior to our examination a gallbladder exploration was done (with normal findings), and three years previously a cholecystostomy was performed, both without relief of symptoms. At the time of our examination a complete urologic as well as gastrointestinal survey revealed no evidence of organic disease. Cholecystography revealed a normally functioning gallbladder, and there was no evidence of gall stones. Management for irritable colon was advised, and the patient has remained symptom-free for at least two years.

Case 3: The patient, a 49 year old housewife, was referred to the Urologic Department with a diagnosis of right kidney abnormality. She dated symptoms of right costovertebral flank pain with frequency and dysuria following an appendectomy and partial oophorectomy fourteen years previously, which incidentally had been done for chronic right lower abdominal pain, with no relief of symptoms. She described the right flank pain often as radiating to the right groin with vaginismus. Multiple dilatations of the right ureter had been done without relief.

Complete investigations revealed no evidence of organic disease. It was then found that she had symptoms referable to an irritable colon and the management instituted has resulted in relief of symptoms for a period of at least two years.

To show that the *initial evaluation* of the patient's symptoms and findings on physical examination are not sufficient to make an accurate diagnosis, our impressions before special examinations were instituted are shown in Table 3.

TABLE 3

INITIAL IMPRESSIONS AFTER EVALUATION OF HISTORY AND PHYSICAL EXAMINATION

Ulcer syndrome	198
Biliary disease	196
Appendiceal disease	109
Renal disease (colic, etc.)	95
Ulcer with obstruction	68
Cardiovascular disease	65
Chronic pelvic inflammatory disease	35
Diverticulitis	35
Symptoms suggesting irritable colon	199

1000 CONSECUTIVE CASES OF IRRITABLE COLON

The characteristic symptoms and physical findings of irritable colon were present in only 20 per cent; that is, 199 cases before special examinations were instituted to exclude organic disease. When patients are treated on the basis of irritable colon without adequate examination, an organic basis for the colonic symptoms may be found later. The presence of a neoplasm in the colon or a urinary calculus may be obvious then. This, of course, means that time has been lost in correcting the cause, as well as the fact that ineffective treatment has been used.

The ages of these individuals at the time the symptoms began and when first seen at the Clinic are shown in Table 4.

TABLE 4

	<i>Age at Time Symptoms Began</i>	<i>Age When First Seen at Clinic</i>
1-10 years.....	4	3
11-20 years.....	74	12
21-30 years.....	341	145
31-40 years.....	344	252
41-50 years.....	176	368
51-60 years.....	50	163
61-70 years.....	10	54
71-80 years.....	1	3

The average duration of symptoms and the sex distribution are shown in Table 5.

TABLE 5

AVERAGE DURATION OF SYMPTOMS:

8 years

DISTRIBUTION AS TO SEX:

Females	591 or 59.1%
Males	409 or 40.9%

The possible *locations* of the abdominal distress has been mentioned. In this group of cases the average *duration* of symptoms was found to be eight years. There usually is no prolonged remission of symptoms which is commonly observed in patients having true inflammatory disease of the colon of this duration. The symptoms are more or less constant from the time of onset and vary in intensity *according to the etiologic factors involved*. The pain may be so severe that narcotics are used for relief, and in these instances we are reminded of the "green-apple colic" of boyhood days, or of patients having chronic ulcerative colitis. At least 31 of the patients in this series were known to have received hypodermic injections of various opiates.

In patients having *severe* distress, its character is usually a cramp-like pain across the lower abdomen, either relieved or intensified temporarily by having a bowel movement or by using an enema. It usually is associated with colonic function or the "passage of gas by rectum." The same features may apply regardless of the location of the distress, but in patients having *localized* distress they apply most commonly to those having distress either in the *upper* or *lower left* abdomen. In the latter group there were 161 patients who also complained of pain in the back (in the region of the lumbosacral spine) at the time of their abdominal distress, which was definitely associated with bowel function.

In patients having *mild* distress the most common complaint is a feeling of fulness and bloating (many quote the term "like a poisoned pup") within one hour after eating (gastro-colic reflex), and they may or may not have observed a relationship with bowel function.

Patients who present symptoms localized to the *right lower* abdominal quadrant, even though appendectomy has been performed, or to the *right upper* abdominal quadrant even though cholecystectomy has been performed, may not have observed any relationship to bowel function. These patients usually believe that they have biliary disease and take bile preparations containing cathartics and saline cathartics frequently over years of time. In many instances no roentgen examination of the gallbladder or biliary tract has been made. This type of treatment obviously increases irritation of the colon and may cause reflex spasm of the sphincter of Oddi, as well as spasm in other parts of the gastrointestinal tract. Our experience⁸ relative to this phase of the subject, particularly with regard to nonvisualization of the gallbladder by cholecystography in the absence of opaque gall stones, coincides with that of Wilkinson⁹. Although these roentgen findings may indicate the presence of nonopaque calculi and obstruction of the cystic duct, unless there is a clear-cut history of biliary colic or jaundice, or both, the irritable colon syndrome should receive adequate consideration. The cholecystographic findings may become normal after using bowel management. In these instances the pain or discomfort in the right abdominal quadrant or upper abdomen are more or less continuous, at least not in clear-cut attacks, over years of time, and there is other evidence of irritable colon. A "gaseous dyspepsia" *per se*, even though it refers to the upper abdomen, does not necessarily indicate disease in the biliary tract.

PHYSICAL EXAMINATION

The physical examination is important from the standpoint of exclusion. The positive findings often include a tender, rope-like sigmoid colon, regardless of the location of symptoms. A distended, somewhat tender cecum may also be palpated. At times there is tenderness along the course of the entire colon, if not a generalized abdominal tenderness.

1000 CONSECUTIVE CASES OF IRRITABLE COLON

There may be a generalized hyperesthesia. When localized, the presence of parietal abdominal neuralgia (Carnett) due to postural strain or spinal abnormalities must be considered. Tenderness due to a spastic irritable colon usually is deep and is elicited only when pressure is made directly over the colon. An associated abdominal distension may or may not be present.

DIAGNOSTIC CRITERIA

Certain observations which suggest a disturbance in the colon are helpful when present. They may be present in patients having either organic disease or a functional disturbance.

The times of day when the abdominal distress is likely to be worse are those times when intestinal activity is greatest, such as in the early morning hours (as in chronic ulcerative colitis) and immediately after eating, due to the gastrocolic reflex.

The distress is most marked when the stools are loose, such as after taking Epsom Salts for stool examinations, or after taking the dye used in cholecystography. Some patients with irritable colon say, "I can't take cathartics."

Temporary relief of the distress is obtained when intra-colonic or intra-abdominal tension is relieved, such as by belching, passing flatus, having a bowel movement, or expelling an enema. Occasionally the distress is worse at these times as a result of incomplete expulsion, due to spasm in the sigmoid colon. During the proctosigmoidoscopic examination unusual spasm may be seen and the patient's abdominal distress may be reproduced. During the administration of the barium enema under fluoroscopic control the suspension may be seen to pass through the various segments of the colon rapidly, as in ulcerative colitis, but its passage usually is in an interrupted fashion and accompanied by spasms. The typical abdominal distress may be reproduced as the suspension enters and may be relieved after its expulsion.

Taking a glass of cold milk will relieve abdominal distress due to peptic ulcer, but may aggravate distress due to irritable colon.

ETIOLOGY

A hypersensitive nervous system in general will react more severely than normal to all manner of stimuli, so that the symptoms referable to the colon may be only a part of a general nervous state. In a comprehensive study of 60 cases of mucous colitis, White and Jones⁵ demonstrated the role of emotional tension as a precipitating factor. They state, "as a rule the symptoms are seen in persons who have labile autonomic nervous systems with concurrent cardiovascular instability, and are most pronounced in persons who are in poor athletic training." They concluded that in most instances the syndrome appears to be a

somatic response to a type of nervous tension, but a number of conditioning factors seem to play a role in the production of symptoms, such as direct irritants of the colon, including rough foods, cathartics, enemas, and coincidental colonic infections.

This is one of the disorders of civilization. It is more common in the more emotional races; among so-called "temperamental stock"; fatigue, as well as nervous stress and strain, often is provocative of attacks in susceptible persons. An upper respiratory infection often causes an acute exacerbation of symptoms.

Formerly, the syndrome of irritable colon was considered to be limited to the female sex but in recent reports this has proved untrue. In this review approximately 60 per cent of the cases were in the female sex and 40 per cent, in the male sex.

Although there are numerous hereditary, constitutional, or neurogenic factors which should receive consideration, we believe sufficient attention has not been given to local irritants of the colon. In our experience the chief etiologic factor was the use of cathartics or irritating enemas (Table 6), the discontinuance of which resulted in relief of symptoms.

TABLE 6
ETIOLOGY

CATHARTICS OR IRRITATING ENEMAS:	
445 cases.....	approximately 45%
NEUROGENIC:	
206 cases.....	approximately 20%
COMBINED:	
323 cases.....	approximately 32%
CONTRIBUTORY:	
Anal abnormalities	
53 cases.....	approximately 5%

In a study of 1000 cases of unstable colon by Jordan¹⁰ it is instructive to note that 73 per cent gave a history of the daily or frequent use of laxatives, enemas and colonic irrigations; 38 per cent of the patients gave no history of symptoms of neurogenic origin. Jordan states, "a patient in this group can therefore be regarded as having an unstable colon because of local irritation, which, from the history of the use of laxatives and the relief obtained with the omission of all measures to produce abnormal contraction, may justly be ascribed to catharsis."

In 20 per cent of the present series of cases the etiology was purely neurogenic in origin, while in 32 per cent the cause was attributable to a combination of local irritation and neurogenic factors. Since relief of symptoms cannot be expected without eradication of the cause, we believe statistics relating to irritable colon should include the chief etiologic factor.

1000 CONSECUTIVE CASES OF IRRITABLE COLON

We routinely classify all patients having this syndrome into one of three groups, i.e., those having local irritation, those having neurogenic causes, or those having a combination of both factors. If there are important contributory or unusual causes, they are included in the diagnosis. In our indices, the phrase "irritable colon" does not occur alone; it is accompanied by the chief etiologic factor.

It is interesting to note that 72 or 7.2 per cent of the patients in this review stated that their symptoms started immediately after an operation which necessitated bed rest, 3.7 per cent after childbirth, and 2.2 per cent after enforced bed rest due to accidents or other causes. This observation is included because it is believed that any cause for bed rest may be an important factor in starting the pernicious cathartic or enema habit.

Millions of dollars are spent every year for cathartics. Although thousands of persons tolerate occasional catharsis without developing an irritable colon, excessive catharsis over years of time may cause serious dysfunction in the gastrointestinal tract which results in significant deficiency disease, to say nothing of the discomfort to the patient, in unusually sensitive individuals.

TREATMENT

If the patient presents questionable evidence for a surgical condition, and the need for immediate surgery has been excluded, observation of the patient while on medical management obviously is in order. Progress examinations at a later date may result in a clear-cut diagnosis.

The aim of treatment obviously is the elimination of all etiologic factors. To be successful, the treatment for irritable colon must be highly individualized, according to the severity of the distress, the type of disturbances in physiologic function, and the etiologic factors involved. When the disturbance is mild and is due to fear of organic disease or to an obvious neurogenic factor which can be eliminated, the reassurance following the thorough examination itself may result in cure.

A good prognosis can be given if the chief etiologic factor is the long-continued self-use of cathartics or irritating enemas. However, when the abdominal distress is severe and multiple etiologic factors are involved, numerous details must be considered in management.

When local irritation is an important factor, it is well to recall the normal function of the colon. Although the colon is primarily an organ of storage, a certain amount of absorption also occurs, particularly in the right colon. This absorption includes fluid, minerals, and certain vitamins. The intestinal content entering the cecum is in a fluid state, and by the time it reaches the rectum it is normally soft-formed. A cathartic irritates the colon, induces rapid transit of the stool through the colon, and results in liquid stools. When this has been a daily occurrence

over years of time the mechanism of the rectal reflex, "nature's call," may be disturbed. If the patient suddenly stops using cathartics and allows normal time for the passage of food through the digestive tract, when the residue reaches the rectum he may not be cognizant of this fact. Too much fluid may be absorbed, resulting in impaction. In these instances, re-training the rectum to a "habit time," such as in the morning after breakfast, has been helpful. Until normal rectal function returns, the passage of stool may be started by the insertion of a glycerine suppository or a small amount of water, if needed. A three-ounce soft rubber ear-bulb syringe has proved useful. A three-ounce oil retention enema may be used at night if there is a tendency to hard stools. Large enemas, as well as irritating cathartics, should not be used because both procedures over-empty the colon and interfere with the re-establishment of the normal "rhythmic" colonic function.

The nature of the illness will need to be explained to many patients, but care should be used in not centering too much attention on colonic function. This may be only a part of a general nervous state and the aim of treatment is to make the patient "colon unconscious." He should follow a well-planned program and otherwise forget the colon.

Many of these individuals have unusual nervous tension and irregular habits in general. While re-establishing normal habits, emphasis must be placed on adequate rest. A good night's sleep is important even though hypnotics may need to be used at the start of treatment. A period of complete bed-rest, mid-day rest periods, more time in bed during weekends, or a vacation may need to be arranged, according to the severity of the complaints.

Antispasmodics and mild sedation commonly are used at the start of treatment. We prefer not to use mineral oil or one of the bland bulk producers by mouth, but this may be advisable for a time, if the principles of management stated above are not used and the diet is low in residue. When a reflex hyperacidity syndrome is present, alkalies are used for symptomatic relief until bowel function returns to normal.

DIET

Patients having irritable colon who believe they are suffering from constipation commonly use high-residue diets, including much "roughage," such as bran and raw apples. They may not realize that this practice can increase a tendency to constipation by increasing spasm in the colon. If the abdominal distress is severe, the use of a non-residue or low-residue diet at the start of treatment will aid in the relief of spasm. The diet should contain no vegetables or fruit during a period of several days, but may contain considerable meat and the usual "bland" foods. With relief of symptoms, cooked vegetables and fruits are added gradually, according to tolerance, until eventually the patient is on a well-

1000 CONSECUTIVE CASES OF IRRITABLE COLON

balanced diet. Raw vegetables and fruits are more irritating than the cooked forms so the latter are added first. In most instances the patient can tolerate cooked vegetables and fruits, and with continued relief of symptoms can add raw vegetables and fruits within a period of two or three weeks. The persistence of distress with constipation usually indicates continued irritation from too much bulk rather than too little.

In patients having mild distress the residue in the diet is adjusted according to bowel function. If the patient is having loose stools, a diet low in residue obviously is indicated. When the history pertaining to diet reveals a lack of essential foods, such as those containing the vitamin B complex and vitamin C, the deficiency must be overcome by using the appropriate vitamin concentrates. If there is a question of absorption from the digestive tract these vitamins should be given parenterally.

When the chief etiologic factor is neurogenic in origin the diet may be of secondary importance. However, the importance of using a well-balanced diet should be emphasized at all times.

HOSPITAL MANAGEMENT

In moderately severe or severe cases of irritable colon, hospitalization is advisable. The details of strict management can be supervised and daily observations will determine the most effective treatment. The three R's of basic therapy, reassurance, relaxation, and re-education², can be enforced. Daily stool examinations furnish evidence pertaining to digestion. Rest and change of environment are important. While the patient is being relieved of symptoms he is taught how to manage his problem. These principles of treatment have proved as significant in this disorder as they have in other conditions, such as diabetes.

SUMMARY

1. In a series of 1000 cases of irritable colon, 320 abdominal operations had been done in 204 of the patients, without relief of symptoms.
2. This review confirms the observations of many other clinicians, namely, that irritable colon is a common and important cause of chronic indigestion, and that it has not received the recognition it deserves.
3. The diagnosis can be made accurately only by the process of exclusion. All of the local, systemic, and reflex organic causes for colonic spasm or dysfunction must receive adequate consideration. This involves appraisal of all systems of the body when no obvious etiologic factors are present. More time and clinical judgment are required here than in the case having evidence of local colonic disease or organic abnormality in other parts of the digestive tract.
4. The most common single etiologic factor was the use of cathartics or irritating enemas; 445 cases, or 45 per cent of the 1000 consecutive cases presented this factor.

5. The symptoms and their duration, diagnostic criteria, and the type of treatment which proved most effective are included in this report.

REFERENCES

1. Brown, R. C.: Spastic irritable bowel, *M. Clin. North America*, 24:193-203 (January) 1940.
2. Kantor, J. L.: Unstable colon, *South. M. J.*, 25:29-37 (January) 1932.
3. Palmer, W. L.: Functional bowel, *M. Clin. North America*, 22:139-151 (January) 1938.
4. Hurst, Sir Arthur: Mucous colic, *Diseases of the Digestive System* (Portis, S. A.), Lea and Febiger, Philadelphia, 1941, pp. 874-877.
5. White, B. V., and Jones, C. M.: Mucous colitis, *Ann. Int. Med.*, 14:854-872 (November) 1940.
6. Table 1 is modified from one used by H. L. Bockus in a lecture given in Youngstown, Ohio, on November 14, 1940.
7. Renshaw, J. F.: Diagnosis and treatment of irritable colon, *S. Clin. North America*, 19:1141-1155 (October) 1939.
8. Collins, E. N., and Root, J. C.: Cholecystography; further observations on use of pitressin and evaluation of other procedures, *Radiology*, 29:216-226 (August) 1937.
9. Wilkinson, S. A.: Chronic cholecystitis versus irritable colon, *J.A.M.A.*, 109:1012-1016 (September 25) 1937.
10. Jordan, Sara M.: Unstable colon and neurosis, *J.A.M.A.*, 99:2234-2237 (December 31) 1932.